Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME 6.] NEW-YORK, FEBRUARY 1, 1851. [NUMBER 20.

THE
Scientific American,
CIRCULATION 16,000.
PUBLISHED WEEKLY
At 128 Fulton, street, N. Y., (Sun Building,) and 13 Court street, Boston, Mass.
BY MUNN & COMPANY,
The Principal Office being at New York.
A. T. Hotchkiss, Boston.
Dexter & Bro., New York City.
Weld & Co., New Orleans.
Stokes & Bro., Philadelphia.
Barlow, Payne & Parken, London.
Responsible Agents may also be found in all the principal cities and towns in the United States.

TERMS---$2 a-year---$1 in advance and the remainder in 6 months.

Rail-Road News.

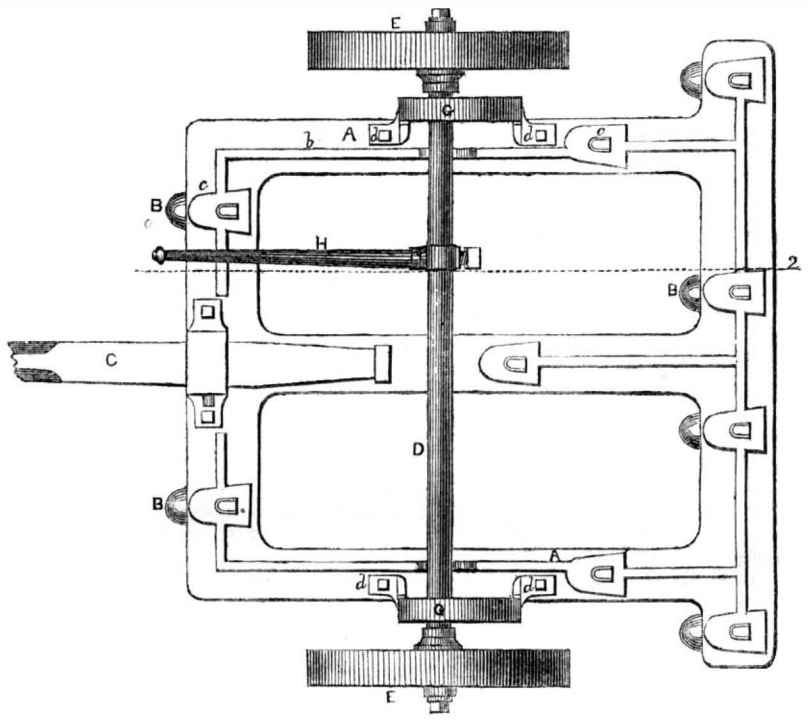
The Panama Railroad.

The Panama Railroad progresses very slowly, but it is said that it will be finished in three years. There are but three stations formed at present. There will be one more, making four from Navy Bay to Gorgona, as follows :—1st, Navy Bay, the commencement: —2d, Gatun, about 7 miles from Navy Bay; 3d, Bohia Soldado, (soldier's camp);—4th, Juan Grande, (Great John.) The distance from Navy Bay to Gorgona, by railroad, is 28 miles; the Chagres river will be crossed by a bridge, 1¼ miles this side of Gorgona. Nothing has been done or commenced on the other side of Gorgona, nor will there be until this is finished. There will be some stupendous work between Gorgona and Panama—a tunnel is to be made of about 3,000 feet. There are about 130 persons at this station, one half of whom are unable to work in consequence of sickness. In fact there are but five months' working time in the whole year, the balance of the time being constantly rainy and sickly. The dry and healthy season has now commenced, and the weather is delightful, with fine breezes from the mountains. On this road there are no contracts given out, consequently there is no room for speculation or imposition. The wages given are good, and every man is treated with attention and good feeling—no more work imposed upon him than is considered prudent. The superintendents and engineers are perfect gentlemen of education and much travel—they are principally from New York. The laborers are mostly from the West, Buffalo, and Erie, Pa. The wages to laborers are $40 per month, with medical attendance and board—no deduction of time for sickness. The other employes on the road have compensation varying from $50 to $100 per month. They talk of finishing this part of the road (to Gorgona) this season; but it seems impossible for the surveys are not perfected and actually decided upon.

The air line distance from Chagres to Panama, is 30¾ miles. The highest point of land on the line of road between Gorgona and Panama is 320 feet above the Pacific.—The Pacific is 12 feet 6-100 higher than the Atlantic. The greatest rise of water known at Panama, 22 feet; the least, 10. There are swamps between Navy Bay and Gatun 2½ feet lower than the Atlantic. The grade of the road from Navy Bay to Gorgona, 26 feet to the mile; Gorgona to Panama, by mule path, 22 miles; Cruces to Panama, by mule path, 17 miles; Isthmus of Tehuantepec, air line distance between the Atlantic and the Pacific, 132 miles; Nicaragua air line distance between the Atlantic and Pacific, 90 miles.

The steamship Great Britain, that was wrecked in Dundrum Bay, was sold for $90,000—about one seventh of its original cost.—As it is an iron vessel, the bargain is a good one for the buyer.

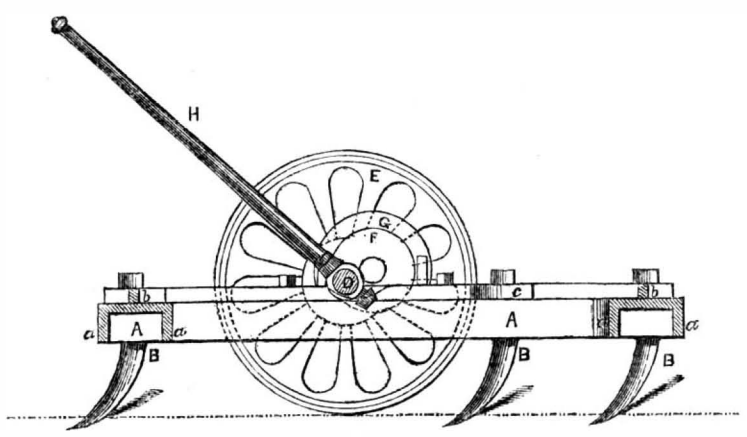
IMPROVED CULTIVATOR.---Figure 1.



This improved Cultivator is the invention of Mr. Andrew Teal, of Geneseo, Livingston Co., N. Y., who has taken measures to secure a patent for the same. Figure 1 is a plan view of the Cultivator; and figure 2 is a longitudinal section, shewlng the eccentric moving axle. The same letters refer to like parts. The cultivator frame, with the teeth, can be lifted up, to raise the teeth from the ground and lower them at pleasure. To do this, the wheels are stationary so far as elevation is concerned, and the axle is attached to an eccentric rolling in a strap on the frame, which is operated by the lever, H, to elevate the frame, the axle always maintaining the same distance from the ground. The frame is made of cast metal, and is constructed of a peculiar form. A A are the sides of the metal frame; B B are the cultivator teeth; C is the pole of the implevement; D is the axle of the wheels, E E; this axle is firmly secured on an eccentric, F. G is a metal strap firmly fixed to the sides, A A, of the frame, and the eccentric, F, works inside of this metal strap. These straps, therefore, are the bearing boxes of the axle of the wheels. H is a lever secured on the axle, D. It will be observed, that by bringing the lever, H, down the broadest part of the eccentric, F, will roll upwards in the strap, G, thus raising the frame, and consequently the cultivator teeth up from the ground, to free them from all obstructions, or to wheel the implement on roads, in fields, &c., like a wagon.

The frame is made of iron, and is cast of such a form as to embrace lightness with great strength, and, as a consequent, great durability. The sides and cross ties are cast partially hollow. The undersides have two side projecting flanges or ribs, *a a*, forming a hollow channel between, and the upper surface has a central projecting rib, *b*, with a depression on every side; *c c* are the sockets for the cultivator teeth; *d d* are the bolts which fasten down the straps, G G, to the sides, A A, of the frame. The dotted lines, (1 2, fig. 1) show where fig. 2 is taken, and the tongue or pole, C, left out.

Figure 2.



The mode of elevating and lowering the cultivator teeth, by the lever and eccentric is really beautiful and simple, and is the best arrangement for that purpose known to us, in combination with a cultivator. This agricultural implement is well worthy of universal attention. We believe that it will receive it, and that it will be generally esteemed. We have never seen an implement of the kind, the teeth of which were so easily elevated and depressed; and we know that this is a quality essential to a good cultivator.

More information may be obtained by letter addressed to Mr. Teal, at the place mentioned above.

Water Gas for Lighting and Heating.

A great many of our papers are now describing Mr. Gillard's Light. The patent specification of it will be found on page 333, Vol. 5, Sci. Am.

Amalgam of Gold or Silver.

Place a gold leaf in the palm of the hand, and pour upon it a globule of mercury. The latter will be seen to absorb, or combine with the gold; forming a more or less fluid and yellow amlagam, according to the proportion of the two metals. This amalgam is used in water gilding. The affinity of mercury for gold and silver is so strong, that those who are foolish enough to clean their watch cases with mercury, or one of its salts, will find them irretrievably spoiled; the same holds good with plated articles cleaned by a vile composition, sold about the streets for this purpose, made of the nitrate of mercury, ground up with whitening. Even those who are obliged to take calomel, and other mercurial medicines, should abstain from wearing any gold articles, or carrying gold money, as the mercury oozes through the pores of the skin, and attaches itself to the gold money carried in the pocket, rendering it so brittle that it may often, when thus contaminated, be broken in two. The best way of restoring money thus spoiled is to keep it red hot for an hour or so, in the bowl of a tobacco-pipe, a crucible, or ladle.

Preparation of Ditto Practised by Water Gilders.

Put 2 drachms of mercury into a crucible, and heat it until vapor is seen to issue from it; now throw into the crucible 1 drachm of gold or silver, and stir them with an iron rod. When the gold or silver is found to be fused, or incorporated with the mercury, the amalgam is poured into cold water; when cold, pour off the water, and collect the amalgam, which will be of about the consistence of soft butter. This after having been bruised in a mortar, or shaken in a strong phial, with repeated portions of salt and water, till the water ceases to be fouled by it, is fit for use, and may be kept for any length of time without injury in a stopped phial. It is essential in this manufacture, that the mercury should be extremely pure, as the least admixture of lead tin, or metal, would materially injure the gilding for which it is used.

Silvering Clock Faces, Barometer Plates, &c.

Mix together equal parts of muriate of silver and moistened cream of tartar; with this rub the plate to be silvered, until the whole has acquired a complete coat, sufficient to preserve it from corrosion. During the operation it may be frequently heated, and immersed in distilled water to wash away the superfluous saline matter.

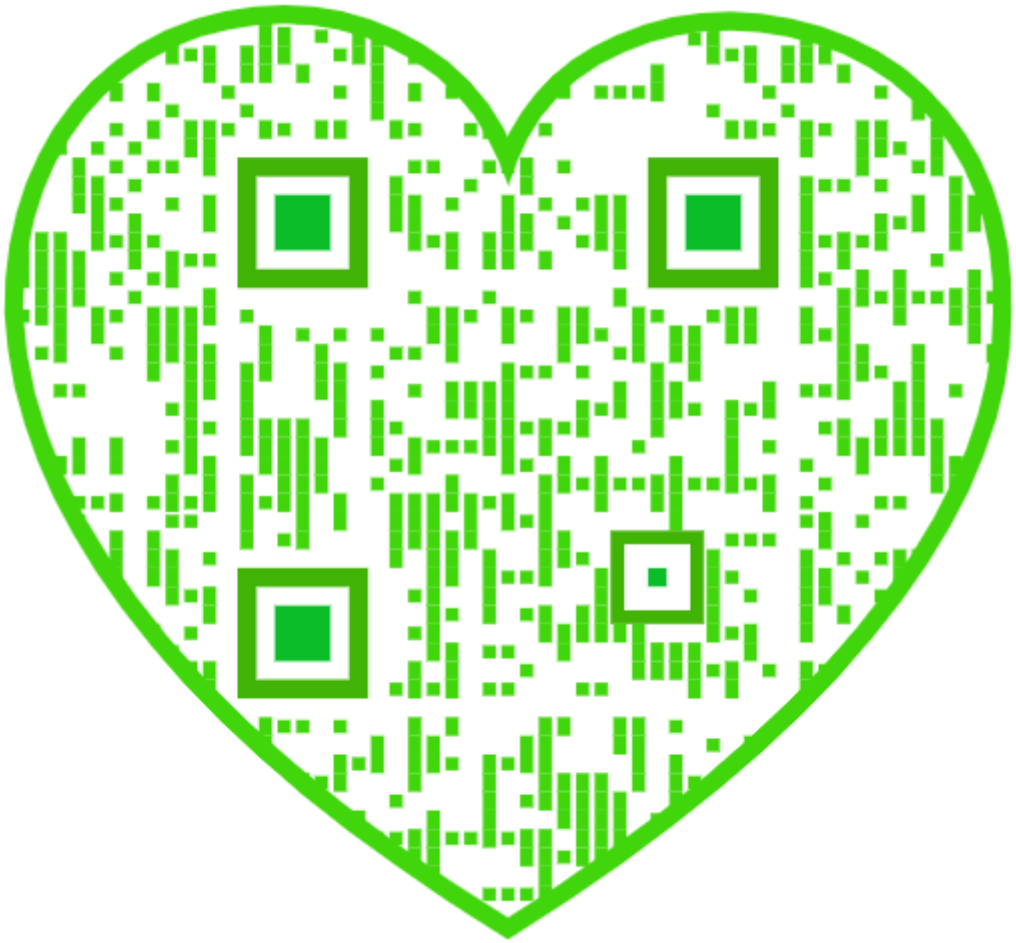
Silvering Plates for the Daguerreotype.

Precipitate oxide of silver from the nitrate by potass; filter, wash, and dry it. Dissolve this oxide in pure liquid ammonia, the solution will be of a yellow color. Immerse a slip of polished copper in it, and let the moisture evaporate. When the copper is quite dry, hold it over a charcoal fire; the oxide will be decomposed, and the metal reduced on the copper in the form of a complete coating. This may be made beautifully bright by polishing with leather. It offers a much more brilliant and smooth surface than that of the last experiment, and is a ready method of silvering copper-plates for the Daguerreotype pictures.

Hydrogen a Metal.

Mr. Edward D. Kendall, of Cambridge, Mass., who has contributed some excellent articles for our columns, has directed our attention to an article from him, published in the Boston Olive Branch, on the 17th of last August, 1850, wherein he takes the same view of hydrogen as Dr. Foster has done in the Sci. Am., of the 11th inst inst.

© 1851 SCIENTIFIC AMERICAN, INC.



Miscellaneous.

The Human Ear.

The story which I will relate, is not long, but it may not be devoid of interest to others, although it only concerns myself. When I was eight years old and at school, a larger boy than myself, made me believe that if I put the pit of a small thorn apple (fruit of the hawthorn) into each ear, and one in each nostril, pushing them well home, and then, sneezing well, they would all come tumbling out of my mouth. Being fond of such legerdemain tricks, as all boys are, I tried the trick, and found that sneezing was good for the nose, but the *pits* abode in my ears, and for two years I was somewhat troubled with them, although no doctor was consulted, for the reason, that I was afraid to tell my parents what I had done, for fear I would get my ears pulled for being so foolish. When I grew up to be somewhat larger, I remember well having paid with interest the grudge I owed the larger boy who played me such a malicious trick. The pit of one of the thorn apples remained in my right ear for six years, and it came out after being loosened by a tremendous pulling at that appendage by one of my parents, for some mischief I had committed. I was not sure till then, but the pits had fallen out or come out some way, for they were pushed very far into my ears, but now I suspected that the other one was still in my left ear, and sometimes I thought I felt it with the head of a pin, but it never hurt me, did not injure my hearing in the least, and I often thought I would consult an ear doctor, (for fear if it was in I might yet suffer from it), but I was afraid; for more than once I made an effort with a blunt instrument to remove what I thought was the pit, when, from the acuteness of the pain I suffered, I desisted, thinking I might be mistaken in my surmises, and was injuring a part of my ear. But on Thursday, last week, all my surmises were confirmed by the removal of the pit from my ear with the point of a blunt pen knife. It came out easily and unexpectedly whilst trying to remove what I thought was some hard wax. I had put a lotion in my ears about a week before to soften the wax, as I had become a little deaf. My left ear feels quite light and clear. This thorn apple pit has been in my ear for 28 years. It measures 3-16 of an inch in its greatest diameter and is ¼ of an inch in length. Where it has rested in my ear, it has left an indention, owing to the growth of the ear since I was eight years of age. The pit is very hard, and is quite sound, but is of a dark color like the wax in the ear. I am happy in being now relieved from all fears of a thorn hedge developing itself in my upper regions. R.

New York, 26th Jan., 1851.

Reform of the Patent Laws---Washington Republic.

"So to our mind nothing is clearer than that no patent should be re-issued, added to, or extended, without notice to the public. An extension, additions or reissue, is distinctly equivalent to a new patent; and no man ought to have his property taken from him by virtue of any such instrument without due advertisement and notice. It is a very serious matter to take his earnings from the industrious mechanic, on the ground that he has innocently manufactured articles the subject of an exclusive privilege, of which he had no notice, and no means of notice. And yet such things may be, and actually are, under the existing laws."

[The above is an extract from a leader in the Washington Republic of the 26th. The article shows a decidedly hostile spirit to inventors and their interests. It mentions a great number of evils in advocacy of a writ of *scire facais*, (a writ we advocate, but not as embraced in the Bill now before the Senate), but none of which such a writ can remedy that we can see. The extract quoted above shows a decidedly unfair and incorrect view of the matter. Can a patent be extended without advertising? No; Sec. 18 of the law of 1836 requires this, and it is done, and the Republic advertises applications for extension to allow all who object to show cause why the patent should not be extended. Now is it not wrong to try and make the public believe, as the above extract does, that all extensions are granted *under the rose*? The whole argument of the Republic goes to show, that before a patent, even, is granted, the petitioner should advertise about the same and explain his invention. This would be a fine way to invite to patent piracy. We are sorry to observe how unfairly the Republic puts the question.

Patent Cases.

U. S. Circuit Court for the Eastern District of Louisiana.—Elisha Bloomer vs. Curtis and Rinney; in equity. Before Judges M'Kinley and M'Caleb.—The complainant, who is the assignee of the right to use Woodworth's planing, tongueing, and grooving machine, within the State of Louisiana, for the extension of the term of patent, commencing on the 27th day of December, 1849, and ending on the 27th day of December 1856, filed a bill of complainant to restrain the defendants from the illegal use of one of the machines within the State of Louisiana.

The defendants opposed the application upon the ground that having purchased of the assignee of the administrator of the patentee, the right to use the machine in question under the first extension of the patent, to wit: from from the 27th day of December, 1842, until the 27th day of December, 1849, that they had authority to use the machine under the special Act of Congress, approved of the 26th day of Febuary, 1845, and which extended the patent for seven years, from and after the 27th day of December, 1845.

The Court after a full hearing of the case, decided, that unles the defendants could show a clause in the Act of Congress, reserving to assignees a right to use machines previously in use, that an injunction must issue.

The injunction was accordingly granted restraining the defendants from the further use of the machine.

Woodworth's Planing Machine: Decision.—Circuit Court of the United States, for the Northern District of New York. John Gibson vs. Ballard and Brenan, December 19, 1850. A motion was made in this cause before his Honor Alfred Conkling, at the Chambers in the city of Auburn, for a preliminary injunction to restrain the defendants from the unauthorized use of the Woodworth's Planing Machine in the village of Watertown.

The motion was argued by R. L. Joice, for the plaintiff, and G. A. Underwood, for defendants, and an injunction granted, according to the prayer of the bill.

In the case of John Gibson vs. D. Haskins, his Honor Judge Conkling, at the same time, granted a similar injunction restrainihg defendant, Haskins, from the farther use of the Woodworth Planing Machine at Jamestown, Chautauque Co., N. Y.

The World's Fair.

Great preparations are now making for sending American machines and articles to London, to be exhibited at the World's Fair. As no article can be received in London without a certificate of an American Central Board, appointed by the Federal Executive, it gives us pleasure to know that an agent, Mr. C. F. Stansbury, is now in this city to grant certificates and pass all the articles intended for the World's Fair: he will be found at the Navy Yard every day from 10 A. M. till 2 P. M., and from 4 till 7 P. M. The Revenue Cutter Forward has been despatched to Philadelphia and Boston, to bring articles from those cities to the Frigate St. Lawrence, which will sail from this port to Southampton, England, in the early part of next month. There is no time now to be lost in preparing for the grand Exhibition. The articles from the United States now amount to nearly 400, and many of them will do credit to the mechanical genius of our country. The natural productions will not be surpassed, if equalled, by any others exhibited there. By late foreign exchanges, we perceive that nearly 9000 British exhibitors will be there; Germany and France will send forth some things which cannot be rivalled by those of any another nation.

The expense to American exhibitors will be greater than to those from the Continent of Europe, but no greater than to the Canadians, many of whom will compete for the prizes.

We hope to see a World's Industrial Fair in our own beloved land at no distant day; we trust that this object will not be lost sight of; we want every stimulant for improvement, and such exhibitions, when well conducted, do most certainly stimulate genius and encourage industry.

Verdict of the Coroner's Jury about the Fallen Buildings.

The following is the vordict of the Coroner's Jury, in relation to the case mentioned by us last week. We shall see what it will amount to:—

"We, the undersigned Jurors, sworn by the Coroner to investigate the cause of the falling of the six houses on the southern side of 21st street, between the Fifth and Sixth avenues, on the afternoon of the 15th of January, 1851, by which William Higgins and others were killed, do find that their deaths were caused by the culpable negligence of William Thomas, George Spencer, and Edward Fleming, in erecting and superintending said buildings.

Robert Smith,	Thos. J. Woodruff,
John Delameter,	James H. Chapman,
Peter J. Bogart,	Ezra Smith,
John S. Allen,	Sylvanus Gedney,
James Webb,	G W. Geer,
James Styles,	John N. M. Berry,
Charles Smithson,	Wm. Tucker,

Wm. F. Havemeyer."

The Coroner's Jury, (in addition to their verdict), do most earnestly recommend that the city, or other authorities, pass such laws or ordinances, regulating the erection, altering or taking down of buildings in this county, as may secure the lives and limbs of persons employed, and that we feel it our duty, and earnestly recommend to capitalists and others, about to erect buildings, to refrain from entering into arrangements with either incompetent or inefficient architects or builders, as it is evident the spirit of speculation too frequently prevails in our community.

Look out for Impostors.

A gentleman writing to us from Brookfield, Vt., says that an individual has been collecting subscriptions in that place and vicinity, for the "Scientific American," agreeing to furnish the paper at one dollar per annum. The rascal, in order to gain the confidence of those of whom he solicited subscriptions, informed them that the publishers had recently adopted the plan of furnishing the paper at $1 per annum in order to increase their subscription list largely, and that if one dollar were paid to him, he would guarantee the paper to be forthcoming in one week after the money was handed in.

To what extent the rascal referred to has duped the public in the Green Mountain State, we are not informed, but we wish it distinctly understood that the individual alluded to is a scoundrel, impostor, and rascal, and the publishers have not established any rates for subscriptions different from those advertised each week in the prospectus of the paper, and that travelling agents are not employed to canvass for the paper at all.

When will people learn wisdom, and instead of paying money to strangers pass the funds over to their Postmaster requesting them to forward for such papers as they may wish.

Publishers and Editors.

Any paper which has not already published the prospectus of the "Scientific American," for Volume 6, will be entitled to a copy of the paper, for one year, without an exchange, by inserting the prospectus, which may be found on the last page of each number. The 20 back numbers already issued will be immediately sent on receipt of a copy of the paper containing the advertisement. Publishers will please to mark the advertisement when sent, that it may not be overlooked, and if an omission, or any irregularity occurs, they wi'l oblige by early informing us.

California Agency.

Messrs. Cooke & Le Count are sole agents for the Scientific American, in California, and will attend promptly to all orders. Their News Office is located in Wells & Co.'s building, San Francisco. Through the energetic management of the above firm, the Scientific American has acquired a very large circulation in the new State.

Expose of Paine's Light

On last Monday evening, Mr. Joseph Dixon, of Jersey City, famous for his crucibles, manufacture of American steel, and practical chemical knowledge, delivered a lecture on light, and demonstrated how easily *wise* people might be deceived with perpetual motions, and new gas lights. He stated that if Mr. Paine's discovery were true, we had to unlearn all we had learned, and that instead of advancing, chemical science had been retrogading. He believed that all Mr. Paine had said about resolving water entirely into hydrogen, was sheer nonsense. He had an apparatus there, exactly like the one seen in the Boston Commonwealth, and paraded in so many papers. It did *wonders* to convince the audience "how easy 'tis to gull the pedants, to gull the would be wise" He asserted, and his demonstration went to prove, that Mr Pain's Electrodes in his decomposing jar were *a* voltaic battery, and his helices might be of wood as well as of iron. The hydrogen jar was connected by a tube with a camphene vessel, and a small tube on the top of the hydrogen jar, exhibited hydrogen undergoing combustion with a pale light, while a beautiful light was shown by a tube coming out of the camphene. We did not examine this vessel, but we must say, that we could not see how the hydrogen could pass through the camphene into the tube, for the exit tube dipped down into the fluid, and no hydrogen from the decomposing jar could get into it. This part of the experiment was neither satisfactory nor demonstrative of what has been alleged by more than one disinterested person who has tried Mr. Paine's experiment in catalyzing the hydrogen. It was not in our power to wait, after the lecture, to ask for a farther explanation about this part of the experiment. Mr. Dixon has bet $5,000 that Mr. Paine cannot resolve water entirely into hydrogen, nor decompose it with only one pole of a magnetic connection. He holds the same opinion as we have set forth from time to time, about this discovery. He is safe in his $5,000.

It has been stated by Dr. Nichols, that the decomposing water in Mr. Paine's jar, was acidulated. This is an evidence that his electrode is a battery, and that zinc is used. After the audience were perfectly satisfied that Mr. Dixon had decomposed the water by his revolving helices, (for when they were in motion, the water bubbled, when stopped, the bubbles stopped), he stepped out on the floor and said, "Ladies and gentlemen, the helices are made of wood." The effect was electrical, humorsome, and laughable,—it extinguished the Electric Light.

Taciturnity of Genius.

In conversation Dante was taciturn or satirical; Butler was silent or caustic; Gray and Alfieri seldom talked or smiled. Descartes, whose avocations formed him for meditation and solitude, was silent; Rousseau was remarkably trite in conversation—not a word of fancy or eloquence warmed him. Milton was unsocial, and even irritable, when much pressed by the talk of others. Addison and Moliere were only observers in society: and Dryden has very honestly told us, "conversation is dull and slow, humor saturnine and reserved; in short, I am not one of those who endeavor to break jests in company, or make repartees.

The Artic arrived in this city at 8 P. M., last Monday, she put into Halifax for coal, and was 16 days 8 hours, from dock to dock. There is bad management somewhere. Why don't the engineers see that plenty of coal is stowed away in the bunkers.

The entire subscription required to establish the steam line between Philadelphia and Liverpool, says the North American, has been obtained. The line will consist of four steamers, which, when completed, will constitute a semi-monthly communication between the two cities.

© 1851 SCIENTIFIC AMERICAN, INC.

Can Flax be Employed as a Substitute for Cotton.

The following remarks relative to this very important question, are condensed from the Manchester (Eng.) Examiner, and are the most sensible of any that we have seen in any cotemporary :—

"It is not necessary only that it should be proved that flax may be mixed with cotton, or worked alone in cotton machinery, but it must be shown that flax so prepared can be afforded at a price so low as to compete with cotton when the American season yields a fair average crop. It is quite possible that flax may be worked to a slight advantage with fair cotton at 8d. per lb., and yet that it could not be so worked if cotton fell below 7d per lb. If flax cost the spinner 7d per lb., there would be no inducement to use it so long as cotton did not rise higher than 7d. The question of the price is then all important, and on this point we have endeavored to obtain some information. We understand that the price of flax in the straw is about £4 ($19,40) per ton, or something less than one half-penny per lb. Three tons of the straw are estimated to make about five cwt. of clean fibre by the existing process; but it is calculated that by the improved methods adopted by Mr. Claussen, at least 6 cwt. will be obtained, and that this can be produced ready for the blower or scutcher in a cotton mill at a cost of 2½d., or not exceeding 3d per lb. It will be seen that in addition to this, there will be a great saving in loss or waste, as compared with cotton, because when the flax enters the blower it will have been already thoroughly cleaned, and cannot lose anything in the process of working beyond some of the finest and lightest fibre.

Besides the question of price, there is also the question of quantity. It may be said if flax be introduced into cotton mills, it will at once become dearer, from the increased demand for it, and the whole advantage from its supposed cheapness, as compared with cotton, will disappear. At first sight this seems to be the case; but a little examination will serve to dispel any great fear on this point. From a Parliamentary return now before us we find that the quantity of flax and tow imported into this country, in the ten months preceding the 5th November last, was 1,610,185 cwt., or upwards or 180,000,000lbs. weight; and, adding what may have arrived during November and December, we may perhaps, estimate the import for the present year at 200,000,000lbs. Now, the largest import of cotton in any one year, was in 1849, when upwards of 750,000,000lbs. were received. The import of flax therefore, is very far below that of cotton. It must, however, be borne in mind, that flax is extensively cultivated in the United Kingdom, and probably not less than from 40,000,000 to 50,000,000lbs. are annually grown at home; thus bringing up the whole supply of flax to 250,000,000 lbs., or in weight to one-third the whole import of cotton. The cultivation of flax is also engaging much of the attention of the "agricultural mind" just now, and the permanence of a moderate price of grain will induce many farmers to attempt the growth of flax. Flax, too, is an article which can be grown, not only in the United Kingdom, but to any extent in most parts of Europe, and there can be no doubt that any increase of demand from the introduction of flax into cotton machinery will soon be met by an increased growth in many parts of the world. We may observe also, that the extension of the use of flax will not be so very rapid. There will be difficulties to encounter and overcome, which, as yet, are probably altogether overlooked. Inventors and patentees, though often among the most able men, are generally among those most frequently deceived and disappointed. Mr. Claussen is sanguine of success, and the results of his experiments give ground for hope; but he can imagine a fair success, in an experiment which is not capable of a complete and speedy realisation on a large scale.

We think it probable that the mixed flax and cotton may serve for weft, where great strength is not required, but we have less confidence with regard to warp."

In addition to the above, we would state that we do not believe a good and durable fabric can be made out of cotton and flax mixed together. It is true that flax is stronger than cotton, but its nature is altogether different, and the mixture will make a more brittle fabric than either pure cotton or linen goods :—We know that this is the case with linen weft employed on cotton warps. It makes a beautiful and strong fabric, but the nature of the two is so different, that the cloth cuts, or rather breaks like glass. And sometimes the linen weft in the loom, if the weft is drawn tight across the raceway of the shuttle, cuts the warp entirely through. This has happened frequently in a factory which we know.

Our Navigation.

The following statement shows the number and tonnage of the vessels built in each State and Territory of the United States, for the year ending on the 30th of June, 1850. It is taken from the Report of the Secretary of the Treasury, transmitting the annual report of the Register of the Treasury of the commerce and navigation of the United States for the fiscal year.

Of the vessels comprised in the table, there were two hundred and forty-seven ships, one hundred and seventeen brigs, five hundred and forty-seven schooners, two hundred and ninety sloops and canal boats, and one hundred and fifty-nine steamers. The largest number of ships built in any State was one hundred and twenty-seven, in Maine; and the largest number of steamers, thirty-four, in Kentucky. The largest tonnage set afloat during the year is that of Maine, and the next largest of New York. Of the one hundred and fifty vessels built in Maryland, one hundred and twenty-five were schooners.

RECAPITULATION.

States.	Vessels built.	Total tonnage.
Maine,	326	91,211 73
New Hampshire	10	6,914 32
Vermont,	1	77 41
Massachusetts	121	35,836 14
Rhode Island,	14	3,587 15
Connecticut,	47	4,819 79
New York,	224	58,342 73
New Jersey,	57	6,201 68
Pennsylvania,	185	21,409 93
Delaware,	16	1,848 82
Maryland,	150	15,064 80
District of Columbia,	8	288 17
Virginia,	34	3,584 04
North Carolina,	33	2,651 59
Georgia,	5	683 82
Florida,	2	79 75
Alabama,	3	113 66
Louisiana,	24	1,592 38
Kentucky,	34	6,460 69
Missouri,	5	1,353 82
Illinois,	13	1,691 21
Ohio,	31	5,214 62
Michigan,	14	2,061 63
Texas,	1	105 54
Oregon,	2	122 42
Total,	1,360	272,218 54

Basaltic Columns.

Hornblend is more tough than hard. So its name indicates. It enters largely into rocks. Hornblend rocks form some of the most beautiful and sublime mountain and landscape scenery in the world. The Giant's Causeway, i the north-east part of Ireland; the Palisades, on the banks of the Hudson river; the Bluffs, called East and West Rock, each about two miles from New Haven, Connecticut, Mount Holyoke and Mount Tom, on the Connecticut River; the richest landscape scenery on the Columbia and other rivers in Oregon; and many other views, both rich and beautiful, in different parts of the world, are hornblend rocks. The Scenery about Edinburgh, Scotland, is said to resemble very nearly that about New Haven, Connecticut, exhibited by the same geological formation—basaltic columns. In both these cities it is the common almost only building material, admirably fitted for the gothic style of architecture. Some poet said of the Citizens of Edinburgh, who have very much impaired the natural scenery about the city for the purposes of arehitecture, that they had so little taste that they sold the sublime and beautiful by the cartload. These columns are very much in the form of hexahedral prisms, from six inches to a foot or two in diameter.

[The above is from one of Josiah Holbrook's letters in the Washington Globe. If he were to travel more extensively, he would be more correct in his representations.

The Age of Gold.

The progress of this age shoots ahead of all calculation, and we must make up our minds to allow nothing to surprise or astonish us. It is less than seven years since our commerce in the Pacific seemed to be limited to our whalers and a few trading ships to Valparaiso and Callao. Panama was only known as a neutral ground, where a congress of nations was to be held. Vessels occasionally reached California, and now and then a ship bound to the mouth of the Columbia River for a cargo of furs passed by the golden gates of San Francisco, when even its handful of inhabitants had no idea that they stood on mines of the precious metals; yet in that short space of time what wonderful changes have taken place! A war with Mexico—the conquest and surrender of California—millions on millions of gold dug from the bowels of the earth—a thousand ships lying in the bay of San Francisco—a hundred thousand inhabitants in San Francisco—an immense emigration pouring in from all directions.

Five years ago, California had a white population of less than 5,000 inhabitants. She is now a State that boasts of a population that numbers almost a half a million. Five years since, Monterey, her capital, had only 300 inhabitants. San Francisco to-day has a population four times as large as the whole country could boast of in 1845. Five years since, California was but little better than a wilderness, while her population confined their ambition almost entirely to the pleasures that spring from scratching and praying.

Fifty millions of dollars have already been exported, and millions are monthly sent to different parts of the world.

Lines of steamers already connect us with San Francisco, and other lines will soon connect San Francisco with Asia and other parts of the world. A ship canal is constructing across the Isthmus to connect the oceans, and our great central railroads are reaching their iron arms thitherward, and in ten years we imagine they will reach the quiet city of the Pacific.

The history of the world presents nothing to be compared with the rapidity of progress, and the development of the resources of the Pacific coast. At the ratio of progress for the last five years past, one generation will not pass away before San Francisco will be numbered among the great metropolitan cities of the world; reaching one arm westward to Asia, and the other eastward to the Atlantic coast, she will grasp the trade of a large portion of the two hemispheres.

French Statistics.

The annual consumption of bonnets, in France, amounts to 25,000,000 francs. The exports of fine and common felt, silk, and straw bonnets exceed 2,850,000 francs per annum.

In Paris and its neighborhood the habitations of one million of citizens do not cover a space of more than 6,075 acres, but this million of individuals, by its talent and industry, gives to the raw materials on which they work a surplus value surpassing the produce of 16,200,000 acres of land—a quantity equal to the produce of Bavaria, Saxony, and Portugal.

No less than 10,000,000 francs worth of shawls are exported every year, and as much consumed in the home trade.

In 1807, the period when France commenced the manufacture of ultra-marine, it cost 1,900 francs for 2 lbs. and 3 ounces; now 10 francs will buy as much.

There are upwards of 200 manufactories of paper in France, employing 4,900 persons, and making 2,900,000 reams per annum.

There is 53,500,000 francs worth of jewelry and silver plate manufactured per annum.

France has not been so prosperous since the revolution of 1848 as she was before that time from 1844; she is now progressing again. The French are becoming good builders of locomotives, but are far behind, yet, in marine steamships.

Roads.

In constructing roads it is far better to make them as level as possible at first, and rather go round than up the hills. It is calculated that the power of a horse, on a level, averages 1,000 lbs., at a moderate pace, and in a rise of 1 in 100 feet he can draw only 900; 1 in 50, 810; 1 in 44, 750; 1 in 40, 720; 1 in 30, 640; 1 in 26, 540; 1 in 24, 500; 1 in 20, 400; 1 in 10, 250. In round numbers, upon a slope of 1 in 44, or 120 feet to the mile, a horse can draw only three-quarters as much as he can upon a level; on a slope of 1 in 24, or 220 feet to a mile, he can draw only half as much; and on a slope of 1 in 10, or 528 feet to the mile, only one-quarter as much. Though a horse on a level is as strong as five men, yet on a steep hill it is less strong than three; for three men, carrying each 100 lbs., will ascend faster than a horse with 300 lbs. The popular theory that a gentle undulating road is less fatiguing to horses than one which is perfectly level, is pronounced erroneous.

New Wingless Bird.

At a recent meeting of the London Linnaean Society. Mr. Westwood called the attention of the society to a wingless bird on Lord Howe's Island—an island between New Holland and Norfolk Island. This spot had been accidentally visited by Captain Poole, of the East India's Company's service, who, considering it a favorable spot for colonization, had induced six Irishmen and their wives and families to settle on it. The place is now one of constant resort for the supply of water and provisions to the South Sea whalers. It is of considerable extent, and has on it two high hills which can be seen at a distance of sixteen leagues at sea. On this island Captain Poole had discovered the bird in question. It is about the size of a quail,—and is considered by the settlers as good eating. Mr. Westwood thought the announcement of the existance of this bird—which was not previously known to exist in those regions—would be received with interest in connection with the discovery of the extinct wingless birds of New Zealand.

Air Locomotives Again.

M. Fillopanti, a foreign gentleman a little distinguished for scientific knowledge, gave a lecture on the evening of Thursday, last week, in explanation of his method to navigate the air. Among the gentlemen of science present were Profs. Loomis, Draper, Gibbs, and others. He advocated rarified air as the cheap inflating material. He stated that an air-ship of cylindro-spherical form (Bell's) could be made to go at the rate of 11 miles per hour, carry 328 passengers, and cost only $20,000. This ship is proposed to carry passengers to California, and is to be 120 feet in diameter, 960 feet long, with inside air at 340° of heat, to be propelled by a locomotive of 240 horse power. Besides the cost mentioned, intermediate stations are to be made to take in supplies from, so that there will be no use of of either Whitney or Benton's railroad being constructed—no use, for this will be an infinitely cheaper method of travelling, and surely there must be some certainty about the success of the project, when such savans as Gen. Tallmadge, President of the American Institute, and the distinguished Professors whose names we have mentioned, grace such select audiences. But there is one thing we must say, however, and that is, Prof. Fillopanti's project is no better than a *fillipino*—it is inferior to the old Porter & Robjohn balloon, which was got up in 1849 to go to California in three days, and which attracted such large crowds to the Tabernacle, one night, and which didn't go at all. A practical demonstration of successful, cheap, and safe aerial navigation, would do more than ten thousand lectures to prove its utility.

A Remington Bridge Fallen.

The Amsterdam (N. Y.) Intelligencer states that the bridge built the last season, and recently finished, across the Mohawk, at Tribes Hill, on the Remington plan, went down last week, being unable to sustain its weight from its immense length.

© 1851 SCIENTIFIC AMERICAN, INC.

Scientific American

NEW YORK, FEBRUARY 1, 1851.

History and Description of the U. S. Patent Office Buildings,

DESIGNED BY WM. P. ELLIOT, ARCHITECT AND ENGINEER, OF WASHINGTON, D. C., AND ADOPTED BY THE XXIVth CONGRESS OF THE U. S., AT THEIR 1ST SESSION, AND APPROVED BY PRESIDENT JACKSON.

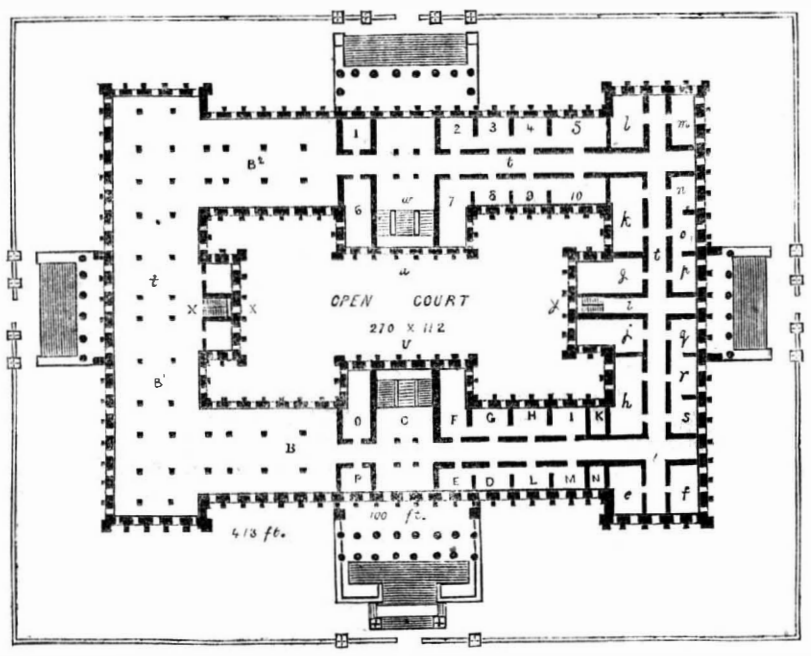
This magnificent building was commenced in the year 1836, and 270 feet of the south side of the block finished and occupied within four years from that period.

The annexed engravings, (figures 1, 2, 3), show the principal, basement, and gallery floors. The vignette at the head of all Letters Patent of the United States, represent a perspective view of the south front.

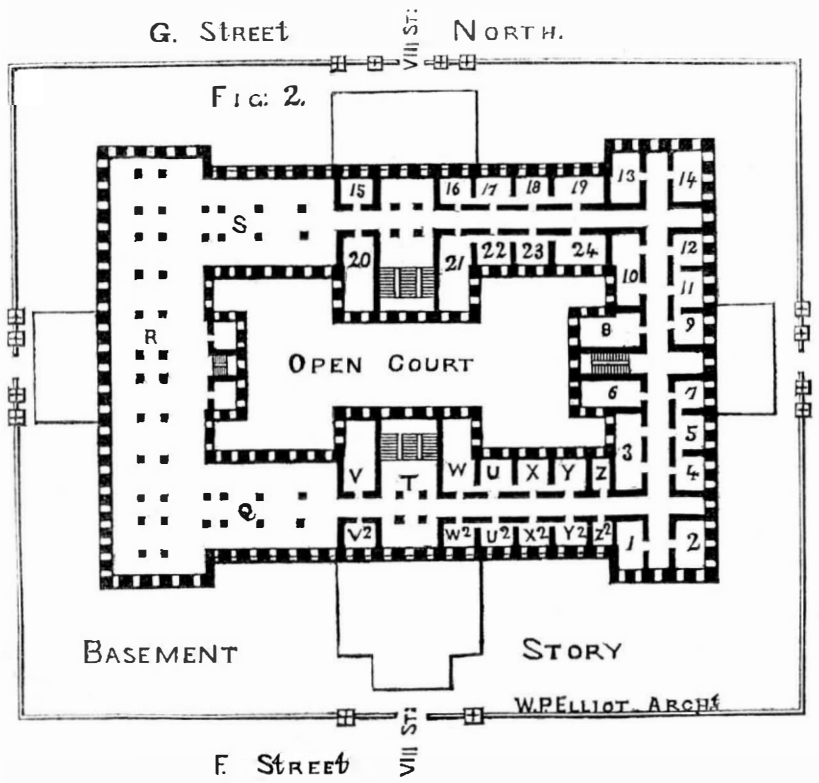
The explanatory references accompanying the plans show the uses to which the halls, galleries, and rooms are to be appropriated. The plans marked 1, 2, 3 show a quadrangular building 413×280 feet, with an open court for light, air, &c., of 270×112 feet, containing a large room for patented models 270×65 feet, and two smaller rooms for the same purpose, each 85—65 feet, communicating with the larger room, and thus making a room of 400 feet by 65 on the principal floor, and 36 rooms for office purposes, and the same number of rooms on the basement floor for rejected models, operative models, the heavier classes of patented models, work-shops, laboratories, furnaces, engines, &c. &c,—and a continuous gallery of 1100×65 feet, designed as a National Gallery for the exhibition of specimens of American skill and ingenuity, as developed by the patented improvements exhibited on the principal story, and to meet the requirements of the 20th section of the Patent Law of 1836. Other parts of the plan are intended to meet the requirements of other sections of this law. The plan of the building and the new code of laws were made and approved at the same time, and the interior of the building was intended to conform to the requirements of this law, as near as possible. The sides of the business part of the building are divided by wide passages of 16 feet, running longitudinally through the centre of the same, with openings at either end for light and air,—by which arrangement, and the open court in the centre, and the surrounding streets, the rooms are well ventilated and lighted. The temperature of the apartments, in cold weather, will be kept at a uniform degree by furnaces in the basement story. The building throughout is fire-proof. The walls of the basement story are to be of brick faced with granite. The superstructure is also to be of brick faced with a beautiful variegated brown and drab colored free-stone, which will harmonize with the gravity of the order of architecture adopted, and the character of the Institution. All the ceilings and floors are to be composed of brick laid in hydraulic cement, and flagged and supported by groin arches. The arched ceiling of the "National Gallery," is supported by rows of square columns and pilasters let into the external walls. The roof to be made light and covered with copper. The building is two stories high, resting upon an elevated basement. The order of architecture adopted for the exterior is the Grecian Doric of the age of Pericles, when the fine arts in Greece, particularly architecture and sculpture, had reached the highest point of excellence. The details are modelled after the celebrated Parthenon, erected on the Acropolis at Athens, one of the finest specimens of Athenian architecture, and which is now in part standing—the marbles having indurated to such a degree, by an exposure of more than 2200 years to the atmosphere, as to resist the action of a chisel. The principal front, on F street, is graced with a portico of 16 columns, octastyle arrangement, —the columns, entablature, and pediment being of the size and proportion of the Parthenon, each column being 18 feet in circumference at the base. The tympanum and metopes are left blank. In the Parthenon these parts were enriched with very fine sculptures in basso-relievo and alto relievo, of such extraordinary excellence that modern artists may well despair of equalling them.

The monotony of this extended front is still farther broken up, and the boldness of the outline increased by projections of thirteen feet next to the east and west sides. The whole building is surrounded with bold antæ or pilasters, let into the external walls, which produce nearly as rich an effect as the isolated frustum of cone columns, and are much stronger, and serve also as buttresses to resist the thrust of the arches. The entablature is continuous, and surrounded by a blocking course, which finishes the superstructure. The windows are arranged between the pilasters. The north front, on G street, is the same as the south front, on F street, except that the inner columns of the portico are omitted. The east front, on Seventh street, is graced with a portico of six columns, which tends to break up the monotony of this extended façade. The west front is relieved by a similar portico. This portico, owing to the position of the ground on the west, rests upon a vaulted terrace, from which it will be approached. The

Figure 1.



vaults of the terrace are to be used for fuel, lumber, &c. The cellar story, under this side of the block, owing to the low grade of Ninth street, has a greater height, and may be divided into rooms, to be appropriated to some useful purpose, as they will be well ventilated and lighted, and approached from the pavement on Ninth street. The horizontal terrace, or pavement, surrounding the whole block, will, on the curb line, be the same size as the appropriation or site on which the building is erected, viz., 500×363 feet, and be surrounded by a handsome ornamented iron railing, with gates, as shown in the figures, to be kept locked at night. The posts may support the lamps for lighting the place.



cutting the floor of the National Gallery on the East side by stairs and chimneys; changing the material so as to make the subordinate parts superior in finish to the principal, and dropping the sills of the basement windows of the east wing below the level of the sills of the centre or main building producing a want of uniformity and consequently destroying the eurythmy of the façade—and also making the windows of the basement too prominent in the composition. The reduction in the width and depth of the pilasters has also tended to take away from the building a portion of its boldness and strength. Had the Architect, who designed the building, been permitted to carry out his own design these alterations would not have been made.

Figure 1 is the principal story of the Patent Office. The right side of the building is bounded by 7th street, west; on the left by 9th st., west. Figures 2 and 3 indicate the other bounding streets.

NOTES.

In erecting this building, as far as it has progressed, it is believed that the original design has been substantially adhered to, except in a few minor points; and in every case where the Superintendent took the liberty to deviate from the plan, the building has evidently been injured: for instance, in the substitution of the curved projection on the North side for the rectangular projection crowned by a triangular pediment; crossing the large arch of the National Gallery by architraves and friezes; cutting through the arches of the basement story to add two additional rows of columns; and changing the style of vaulting from the groin arch to the barrel arch system;

Explanatory references to the Original Plan of the Patent Office, adopted by Congress and approved by President Jackson in 1836.

Figure 1 is a plan of the principal story; fig. 2 is a plan of the basement story; fig. 3 is a plan of the Gallery story.

A—National Gallery.

B—Hall for pending and recently patented models.

C—Vestibule.

D—Commissioner's Room.

E—Chief Clerk's Room.

F—Draughtsman's Room.

G—Ante room now used as an Examiner's room.

H—Copying Clerk and Letter Books—Library and Librarian.

I—Examiner's room also occupied by the Assistant Examiner.

K—Assistant Draughtsman.

L—Pay Clerk and Records and Record Clerk.

M—Examiner and Assistant Examiner.

N—Messenger.

O—Caveat Models.

P—Machinist.

Q—Rejected Models.

R—Ditto.

S—Ditto.

T—Vestibule of Basement.

U—Workshop and Lathe.

V—Labratory and Experimenting Room.

W—Seed Room.

X—Assistant Messenger &c.

Y—Room for Stove plates and large models.

Z—Furnace.

U^2—Operative models.

V^2—Room for Wood.

W^2—Room for Lumber.

X^2—Operative models.

Y^2—Coal Room.

Z^2—Furnace.

e—Room for Records and Clerks.

f—Room for Drawings and Assist. Draughtsmen.

g—Stationery room and Assistant Messenger.

h—Library and Librarian.

i—Vestibule and Stairs.

j—Room for Extension of the Library.

k—Agricultural Statistics.

l—Clerks of Ditto.

m, *n*—Copying and Recording Clerks.

o—Examiner.

p—Assistant Examiner to Ditto.

q—Examiner.

r—Assistant Examiner to Ditto.

s—Examiner.

t—Continuous Passages extending round the Block.

u—Open Court for light and Air 270×112 feet.

v—Stairs of South side.

w—Ditto of North.

x—Ditto of West.

y—Ditto of East.

B′—Continuation of the model Room for Patented models.

B^2—Ditto.

The rooms numbered 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, may be used for Design Plates, Operative Models, Work Shops, Machinist, Clerks, &c. The rooms numbered 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, are designed to provide room for the extraordinary increase of the Patent Office.

The rooms numbered 21, 22, 23, 24, will be required for the same purpose.

REMARKS ON THE PLAN OF THE PATENT OFFICE.

As the number of applications for patents is increasing annually to an extraordinary degree, numbering 2,193 for the year 1850, and only three in the year 1790, and promising to reach 2,500 the present year, and in most cases accompanied by models averaging at least one cube foot in size, and there being at present upwards of 17,200 models in the office, and a large portion of which are unclassified for want of room and the business of the Department increasing in a ratio almost equal

© 1851 SCIENTIFIC AMERICAN, INC.

to that of the number of applications, rendering it necessary to provide more room not only for the rapid accumulation of models but also for additional examiners, clerks, draughtsmen, machinists, and other officers required to carry on the increased business of the Department, and as the building, large as it appears to be, (413×280 feet) will be filled in less than twenty years, it seems to be a great misfortune that the architect did not select a larger lot of ground for the site of the Patent Office, to admit of the construction of a larger building—one that would have sufficed for the wants of the Department for a century at least.

It is true the collection of articles in the "National Gallery" might be removed to another building, and thus more room be provided for models and the open court of 270×112 feet could be covered with a glass roof in the manner of the Exchange Building in Paris, which would furnish upwards of 20,000 additional square feet, of which a large portion might be appropriated to the display of models and other articles, yet it is evident that in less than fifty years the whole block, open court, and other parts of the area will be crowded.

To add another story to the building would be inadmisable in this order of architecture, as the blocking course of the entablature finishes the building.

The basement story of the south side cannot be used for models owing to its damp state, arising from the omission of the builder to construct the cellar story in this portion of the structure. Already, the models at present crowded into the basement rooms are becoming very much corroded by dampness, and unless removed to drier apartments will be totally ruined.

Several of the clerks have suffered greatly from rheumatism, and other diseases, caused by being obliged to perform their daily labor in these damp apartments, and the Records, Books, drawings, and original papers are daily injured and liable to be lost in their transit to and from the principal floor to the basement story.

And the same may be said of the models. Much time is also lost by not having the current business of the office performed upon the same floor.

The rooms in the basement were never intended for the performance of clerical duties: they were mostly intended for fuel, furnaces &c., and to keep the principal story dry and comfortable.

Although more room is required to conduct the business of the Patent Office, and although the structure was originated and built expressly for conducting the Department of Patents, it has been diverted, in a measure, from its original purpose; and deliberate attempts are now being made to consummate the greatest outrage ever perpetrated against the interests and feelings of the inventive community of our country, and that is not small now, both in influence and numbers. Let us go over the history of this affair.

In the Report for the year 1844, Mr. Ellsworth says, "The increase of models renders daily the transaction of business more difficult. The models of the patented inventions are crowded so much as to prevent classification; while models of rejected applications, equally important for exhibition, to enable supposed inventors to settle doubts as to originality, are not exhibited at all. It has been hoped that the large upper hall, designed originally for models, would not be diverted to other objects without some substitute being furnished. The beautiful collection of curiosities, however, from various parts of the world, forming the "National Gallery," are too important and interesting to be crowded out. There seems to be no alternative but to extend the building: this can be done at a moderate expense, if the work is performed by contract, under careful supervision. No new plan need now be presented. The original design contemplated two additional wings, one of which, added on the west side, would give sufficient accommodation by furnishing continuous rooms for models and the gallery."

Messrs. Ellsworth and Burke, the former Commissioners, finding that they could not conveniently carry on the business of the office, as it should be carried on, without more office room, and more space in which to arrange and classify the piles of accumulated models, both patented and unpatented, applied to Congress, in 1844, 1845, 1846, and 1847 for an appropriation to complete the east and west wings of the building, according to the original plan. In 1849, Congress commenced by appropriating $50,000 out of the Patent Fund toward erecting the east and west wings of the Patent Office, according to the original plan. In 1850 a farther appropriation of $90,000 same was made from the same fund and for the

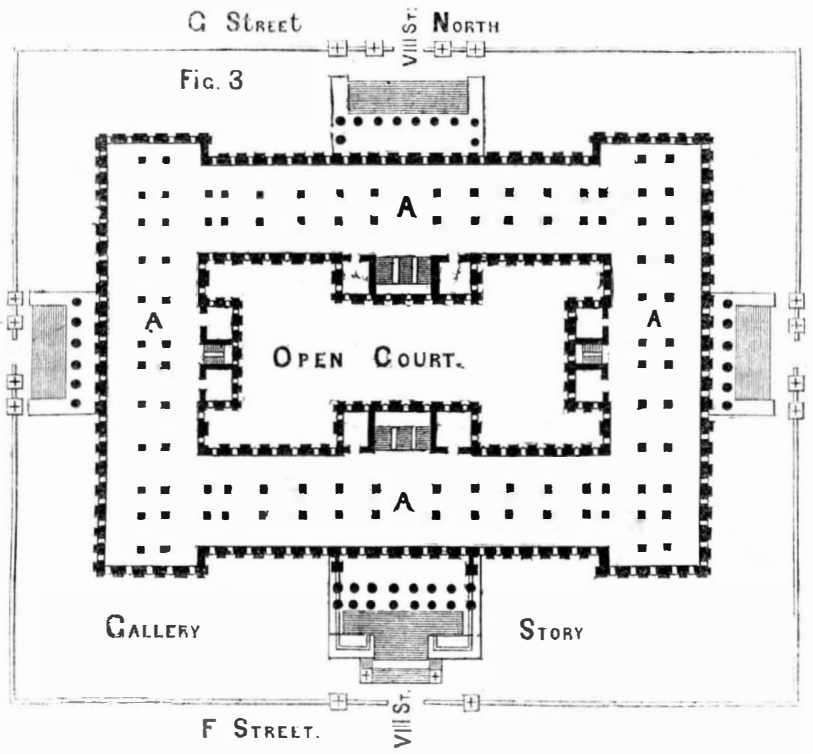


Fig. 3

priation bill the $90,000, towards "the erection of the wings of the Patent Office building, according to the original plan," and his motion would have been carried, and the work stopped and left as a disgraceful ruin, had not a majority of the Senators understood the true state of the Patent Office better than its official head, and treated his recommendation as it deserved to be treated. Now, the present Secretary of the Interior, Mr. Stuart, taking advantage of the incorrect statements of the Commissioner of Patents, in relation to the actual wants of his Bureau, and his willingness to abandon the rights and interests of inventors, and the proper care of their valuable property, coolly and deliberately recommends to Congress, in his Report of the 2nd ult., published in the National Intelligencer of the 3rd ult., "that the two wings of the Patent Office be finished, and that they be appropriated to the accommodation of the Department of the Interior, and the different officers attached thereto."

It is but justice to Mr. Ewbank to say, however, that although he thought the wings of the Patent Office not required when the National Gallery would be removed to the Smithsonian Institute, he called upon Congress to refund the money which had been taken out of the Patent Fund for their erection. We believe that the wings of the Patent Office should belong to the Patent Office, and no other Department, for if they be absorbed by any other Department now, when they are required for Patent purposes, it will be no easy matter to get them—and required they must be at no very distant day. If the wings of the Patent Office be appropriated to the business of the new Department, it would be little better than highway robbery of the Patent Fund, to the amount of $140,000, which has been applied towards their erection. Unless this is paid up, if the recommendation of the Secretary of the Interior is carried out, no man will look upon the transaction in any other light than as one of Gothic pillage. We want justice—no more and no less—done to the inventors, whose moneys have been so liberally lavished on building the Patent Office. The recommendation of the Secretary of the Interior to apply the wings of the Patent Office or the benefit of the Department of which he is the head, is the coolest, most provoking and presumptuous recommendation that has come under our notice for a long time. Within the past year the greatest amount of Vandalism has been practiced against the Patent Office, by cutting and carving it all for the benefit of this new Department of the Interior. Orders have been given to subdivide the continuous "National Gallery" into small office rooms, and to add an attic story, for the Department of the Interior, thus entirely destroying the original plan of the building, and breaking up the Gallery, which has always been considered the most beautiful feature of the structure. The Patent Office was never designed nor intended to be devoted to any other purposes than those connected with patents. Mr. Goddard Chief Clerk of the Department of the Interior, in a letter to the Commissioner of Patents, dated 3rd inst., in order to answer certain questions of the Commissioner of Public Buildings, requested a statement of the number of rooms now occupied by the Patent Office, and whether any more, and what number, were needed. Mr. Lawrence, Chief Clerk of the Patent Office, on the 7th inst., four days after the other, makes the following answer, which we publish entire, and it will be found very interesting, as being a brief report of the state of the Patent Office:—

"Patent Office, Jan. 7, 1851.

Sir—In answer to your note of the 3d inst., directed to the Commissioner of Patents, and by him referred to me for reply, I have to state that there are twelve business rooms occupied by the regular force of the office on the main floor, and two small rooms at the end of the west passage, containing rejected models. In the basement story there are ten rooms, four of which are occupied by the temporary clerks, three used for storing the models of pending applications, two for coal rooms, and one used by members of the National Institute. The entire west passage on the basement is used for storing rejected models. This passage, though large, is entirely inadequate for the classification and proper disposition of the models already deposited there, and is at best but poorly adapted to the purposes of a model room. The second room is now filled with the files and records of the office, and an additional room for them is indispensable. The same may be said of the Librarian and Draughtsman's room. The "Gallery," now occupied by the Smithsonian Institution for the exhibition of the collection of the United States Exploring Expedition, will probably be retained for that purpose; should this be the case, the entire upper story of the east wing would not be too much room for the arrangement of models. The business of the office is steadily on the increase, and although the number of applications in 1849 far exceeded any previous year, still the past year has exceeded 1849, in the number of applications, by nearly three hundred. The number of applications in 1850 will not vary far from twenty-two hundred, and the number of models received on those applications may safely be estimated at one thousand. You will thus perceive the necessity of providing not only for the present but prospective wants of the office, in that particular. Should the examining force of the office be increased (and the increase of business seems already to demand it) additional rooms for Examiners will necessarily be required. In case such an increase should consist of two principal and two assistant Examiners, two more rooms will be indispensable for their accommodation. If four assistant Examiners should be added, four rooms will be required, as such additional assistants would not occupy the rooms now used by the Examiners and their present assistants. In case the latter plan for the additional force should be adopted, the room now occupied by the Examiner and assistant would be occupied by the two assistants, and the principal Examiners would take separate rooms. The comparison of copies with originals is now done in the same room where the recording and copying is going on, causing much interruption and many errors. The clerk charged with this duty should therefore be provided with a room where it can be done without interfering with the proper execution of the recording and copying. In my opinion, at least six more rooms are indispensable for the transaction of business, besides the use of the Gallery of the east wing for the deposit of models. Respectfully,

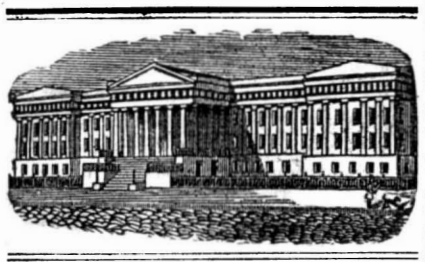
Dewitt C. Lawrence, Chief Clerk.
D. C. Goddard, Chief Clerk Dept.

[Query—Why did not the Commissioner himself answer the letter?

Those who know about the business of the Patent Office, state, that no less than thirty rooms are at present required by the office, and from the cautious manner in which Mr. Lawrence expresses himself, we would infer that his inner conviction was for thirty new rooms instead of six. At the present moment the models are arranged and kept in a shameful manner. What signifies the sending of models to our Patent Office, as representations of American genius, when they are stowed away in dark places, and treated so scandalously. There is a want of room and facilities for classifying and arranging the rapidly increasing number of models. Mr. Stoughton, the machinist of the Patent Office, in his last report, stated that "the policy of Congress in the law passed relating to the Patent Office, indicated a desire that every possible advantage should be given to inventors to examine every thing for which patents have been asked, so that they may not waste their thought, time, and means upon that which had been produced before. These facilities cannot be granted, as the building is now occupied, for want of proper room to arrange the models. The models now in the Patent Office have cost the inventors, at a moderate calculation, $500,000 (half a million)." This is what Mr. Stoughton said in 1850, and, lo and behold! the Department of the Interior has been plundering, and designs to plunder more largely, the room required for the patent business. We have said once before, that "the Patent Office was the biggest pirate of inventions in our country," as it had been often conducted, and now we say, "the Department of the Interior is the greatest pirate of inventors' property in our country." The Patent Office building never was intended to accommodate any other Department. To-

© 1851 SCIENTIFIC AMERICAN, INC.

wards its erection $248,000 (nearly half a million) have been paid out of the Patent Fund—the money paid in by inventors, and did not cost the rest of our citizens a single cent. Is it not a high-handed recklessness, then, to moral principles, in using and abusing the Patent Office, for any other purposes than those for which it was originally designed?



☞Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.

FOR THE WEEK ENDING JANUARY 22, 1851.

To A. W. Thompson, of Philadelphia, Pa., for improved Propeller.

I claim a propeller constructed as herein described, in such a manner that any one of its blades, in any line, drawn either parallel or perpendicular to its entering edge, shall have the curvature of a parabola produced, as herein set forth.

To Jacob Scheitlin, of Louisville, Ky., for improvement in Brick Presses.

I claim, first, in combination with the clay ducts and connecting carriage of moulds, the rods with their knives, (for the purpose of cutting off and foregin in to the moulds the regular quantity of clay,) and sliding plate or gate, for the purpose of opening and closing the communication between the clay ducts and moulds, as herein described.

Second, I claim the arrangement of the pins, connecting rod, and standard, with its arm, for the purpose of removing the brick after it is raised from the moulds, when the same are operated by means of the cranks, as herein described and shown.

To G. Thatcher, of Albany, N. Y., for improvement in Stoves.

I do not claim the device of sliding doors between parallel jambs or plates, for the purpose of concealing the same; but I claim providing sliding doors with flanges on their vertical edges, the rear flanges serving the purpose of hinges in opening and closing the same; and also serving to form air-tight joints when the doors are closed. And the front flanges serving in connection with the projecting ends of side plates, to relieve the appearance of a joint, when the doors are opened, as before described.

I also claim the providing of the side plates with projecting front plates, for the purpose of forming fronts to the spaces into which the doors are slid when open, to conceal the same, and in connection with the rear flanges, to form the hinges of the doors, when closing the same; and also to conceal a portion of the front flanges when the doors are opened and slid back, as described.

To E. T. Parker, of Berkley, Ala., for improvement in Convertible Plow Stock.

I claim constructing a sub-soil plow with removable mould board and cutter, in combination with the tri-pronged cultivating teeth, that the same stock may be used either for a sub-soil plow, or for common plowing and cultivating land, as herein set forth.

To Charles Starr, of New York, N. Y., for improvement in tools for Embossing the backs of Books.

I claim forming circular embossing gilding or lettering tools of any required pattern, for embossing, gilding, and lettering book covers, by having a case or hollow metal cylinder fitting on a roller, and having an opening or openings in it, of any required form, for a panel or other border, the part of the periphery of the roller within the opening or openings in the case, having any required number of small tools, of any suitable form or pattern, secured to it, the surfaces of the said tools standing even with the outer face of the case or cylinder, or by the employment of any number of tools, consisting of parts of a hollow cylinder secured to a solid cylinder, substantially in the manner described.

To A. A. Wilder, of Detroit, Michigan, for improved Lee-way Indicator.

I claim hanging the vane loose at the bottom of the rod, which carries or communicates with the pointet, and holding it either in position for operation, or secure within the vessel above the bottom of the keel, by means of a spring or its equivalent, operating substantially as herein shown and for the purposes set forth.

[The above invention was illustrated and described in No. 8, present volume of the Sci. Am.]

To Daniel Wilson, Jr., (assignor to D. Wilson, Jr., & H. M. Bird,) of North Chelmsford, Mass., for Horse Shoe Nail Machine.

I claim the simple combination of the punch, the slotted bed-die the heading die, the header slide, discharging orifice and header, as arranged, constructed, and made to operate together, substantially as specified, or, in other words, their arrangement and construction essentially as explained, whereby they are made to separate the nail blank from the rolled plate to move it downwards upon the header slide, to cause the header slide to advance, in the meantime, to hold the nail blank, by means of the punch and header slide, to cause the header slide to slide underneath the nail while it is so held, to carry the header against the nail and head it, to cause the header slide to retract or move backwards far enough to carry or move the discharging orifice directly under the nail, and so that the nail may be forced down into or through such orifice, by the further depression of the punch which next takes place, and finally to elevate the said punch to the first or highest position.

DESIGNS.

To J. G. Lamb, of Cincinnati, Ohio, for Design for Stoves.

To S. W. Gibbs, of Albany, N. Y., (assignor to North, Harrison, & Co., of Philadelphia, Pa.,) for Design for Stoves.

To S. W. Gibbs, (assignor to Ira Jagger, Wm. B. B. Treadwell, & J. S. Perry), of Albany, N. Y., for Design for Cooking Stoves.

Shanghai and the Chinese.

The Chinese excel in the compactness of their cooking apparatus, which consists of an earthenware stove, about the size of a flower pot, in which they burn charcoal, and fan it very quickly into a red heat; by covering this over with an iron thing, something like a dish cover, they bake pastry very nicely.

About Shanghai the country is very flat, and ages ago it must have been covered with water. It appears to be going to decay for all the bridges and the joss houses, and the statues in them, are going to ruin. From the general character of the Chinese just now, they appear not to have two ideas, yet their buildings, tombs, and statues show them to have been a fine race, some time or other. It is pitiable to see their fine bridges and buildings going to ruin. The land is divided into large fields of 40 or 50 acres by ditches, which are navigable for their small baats when the tide is in, and are used for irrigating the lands. These fields are sub-divided by narrow paths, and almost every family has a small quantity of land, on which they grow wheat, cotton, and rice; and the surplus of any of these, after they have taken what they require for their own use, is sold, and fire-wood generally bought with it. Fish is very abundant, and the ditches attached to their property in a great measure supply them. The men do the heavy work in the fields, but the women and girls assist at harvest time, and in packing cotton.

They thrash with a flail, which is an improvement on ours. It has two fashes, which are connected by strings; they also have good winnowing machines. * * * They have a very nice gin for cleansing the seed of cotton, but not equal to the American ones. They spin and weave by hand. The cloth they make is very good and strong, but only about fourteen inches wide. Nearly all the native cloth is dyed blue; indeed that is the only color used except drab, and white for mourning. They grow their own indigo. The cotton seeds, after cleaning the cotton, they feed sheep and goats with, and also grind or crush it, to extract oil from it, and feed the cattle with the remainder. They grind the wheat with millstones, which are turned by a pony or Buffalo, and make very fine flour.

For the Scientific American.
Mechanical Principles.--No. 5.

I do not intend to occupy any more space in the columns of the Scientific American with this subject, than a few brief remarks in the present number. As a subject somewhat abstract, it is not of much interest to the great majority. My object was to present, clearly, in as few words as possible, the outlines of the science; and I will now conclude with a few words of advice to those who are in search of new things.

Before any man assumes to have discovered something new, he should inquire,—"do I know all that is already known on this subject?" We hear of this and that alleged new discovery, and many such are made, but it is also true that a great many of them are not improvements nor discoveries. Some men, with a hardihood of no common kind, leap out with a discovery which, in their estimation, proves all the old philosophers to have been men of little capacity, and of less correct knowledge. This has been the case in two instances in the Scientific American. One, who professed to have discovered a new principle in mechanical philosophy, about *inertia*, and the best form of sailing vessels; and the other a totally different principle in *inertia*, namely "gravity," and it was in answer to him that I commenced these articles. By a careful consideration of the works of Newton and Euler, it will be found that no new light has been elicited in Mechanical Philosophy.

In the construction of any machine, no man can make it give out more power than it receives:—the steam is the power of an engine, the water is that of a water wheel. That machine is most perfect which transmits the greatest amount of the real power, whether it be of water or steam. The rendering more simple the various parts of a machine, so as to decrease friction, &c., is a subject which should engage the attention of every mechanic, because the field for improvement, in this respect, is very extended—to save power, in all machines, is a grand desideratum. There are but few who have applied any philosophic improvement, like the "governor" to machinery—such inventions are rare.

Various as are the modifications of machines, there are only three objects to which their utility tends:—First, furnishing the means of giving to the moving force, a good direction. Second, accommodating the velocity of the work to be performed in the most proper and economical manner. Third, guiding the motive power to produce the greatest effect, so as not to throw any of it away. Now, to attain this knowledge, no mere theory will suffice; experience alone is the teacher, but this experience must be linked with a good judgment, and a knowledge of mechanical principles, or else no improvement can be expected.

MACLAURIN.

Fast Sailing Ships.

The British are beginning to awake to the importance of fast sailing ships, to compete with America. It is well known that American ships have taken the trade out of the hands of English houses and that all the fine packet ships running between New York and and Liverpool are built in America. The Liverpool Albion states that clipper built ships are beginning to be built and to supersede all others there.

It states that in the year 1822 some spirited Scotchman located in Liverpool built in the town several vessels for the Charleston trade, called the Lalla Rookh, Marmion, &c., which were superior in sailing qualities to any other then existing. They did not meet with encouragement, were afterwards sent out to Brazils, and were subsequently wrecked.—Their preformances kept alive, however, some spirit of enterprise in merchants connected with the Brazils, but it was not until the year 1839 that the Columbus began her career of navigation between this port and Pernambuco. She was built in London for a paddle-wheel steamer, under the superintendence of Captain Daniel Green, and was intended to test the experiment of working steam with quicksilver, instead of by the ordinary method. That experiment did not answer; she was converted into a sailing ship; and her performance induced the owners to build a kind of sister ship, called the Sword-fish commanded by a brother of Captain Green, between whom there has been a praiseworthy rivalry, and they have at times run each other very hard, each having made passages of about twenty-two days to and from Pernambuco. Beyond this little notice was taken of the matter, except later on the building here of the Seraphina and Empress, to compete with the above vessels.—Shipbuilders and merchants were wedded to old ideas, and content to jog on in the old-fashisned way.

To Aberdeen belongs the merit of carrying out a practical illustration of the advantages to be derived from building ships combining superior sailing qualities with great capacity for cargo, and it is hardly necessary to point to the Pilot-fish, the Bonita, the Reindeer, and Emperor, as reflecting infinite credit on the spirited parties who projected those vessels. The system is now being generally adopted, sharpened, as it must be, by free trade and competition with foreigners.

For the Scientific American.
Belts and Pulleys.

In Vol. 6, page 53 of the Scientific American is an inquiry relative to the use of thick and thin belts; in the number succeding you alluded to it without giving a definite answer,—and in No. 18, E. M. Chaffee attempts to answer the question, but fails in correctness. E. M. C's result, from his experiment, is correct, and would apply were the driver and driven pulleys of the same size, but when the sizes vary it is incorrect; for, supposing the one pulley was 48 inches diameter, and the other only 12, the difference in speed, with an extremely thin belt, would be precisely four times, because 12 is contained 4 times in 48; now if the belt is of sufficient thickness to increase the large pulley one inch in diameter, making it 49 inches, the same belt will increase the small one an inch, making it 13 inches, causing the small pulley to make only 3·779 revolutions to one of the large pulley. The large and small pulley must be increased or diminished, relatively, to keep the speed equal. Experiment has taught that ropes, belts, &c., in coiling around cylinders or pulleys, stretch on the outer side, and contract on the inner—and the stretch being 2, and the contraction 1—consequently, the point that neither stretches nor contracts, is one-third the thickness from the inside, and two-thirds from the outside of the rope or belt. If in the above illustration we wish to know how thick the belt must be to increase the diameters one inch, we find that it is increased half an inch on each side, and as that point of the belt that keeps its length must be half an inch from the surface of the pulley, by the above rule we see that the contraction is one, and the stretch two, and that the belt must be 3 half inches, or one and a half inch thick.

The rule for calculating speed by belts, accurately, is always to add to the diameter of the pulleys and drums, two-thirds the thickness of the belt or rope to be used in making the calculations, but in making the pulleys they are to be ⅔ thickness less in diameter.

H. W. BENNETT.

Rutland, Vt., Jan. 20, 1851.

English Patents to Americans.

Edward Dunn, of New York, now residing in London, for an improved engine for producing motive power by the expansion of alcoholic vapors. Patent dated Dec. 26, 1850.

John Ransom St. John, of New York, engineer, for improvements in the construction of compasses and apparatus for ascertaining and registering the velocity of ships through the water. Patent dated 27th Dec. 1850. This is a great invention. Mr. St. John is a resident of this city.

© 1851 SCIENTIFIC AMERICAN, INC.

TO CORRESPONDENTS.

"M. K., of Mass."—We have received your letter about the turpentine engine. If the lamp goes out, as you say, when up with the balloon, then the hubble, eh?

"J. B. S., of Mass."—We have not a single number of volume 3 on hand.

"L. McC., of Ireland."—Your subscription will expire at no 39, Vol. 6. We are obliged to pre-pay 2c. postage on each paper mailed to your country.

"W. McB., of Ohio."—We have carefully examined the sketch of your alleged improvement in planing machines, and must confess that we do not fully understand the principle upon which it operates. It seems to be somewhat similar to the one invented by Mr. Burton, of Rome, N. Y., a model of which we have in our possession. You had better send us a model for further examination in order that we may more fully understand the principle of it.

"E. J. E., of S. C."—The principle of your device is well known and the application of it to a new purpose could not be patented. We do not discover any combination in the sketch which would be regarded as of sufficient novelty to warrant an application for Letters Patent. We therefore advise you not to apply. $2 received.

"J. L., of Va."—We do not know the price of the heddles refered to in No. 13. You had better address the inventors who will no doubt furnish the desired information. We cannot send Gilroy's Art of Weaving by mail without cutting the covers off. $1 received.

"W. C., of Ct."—The assignment was sent to the Patent Office on the 11th. The three months would have been out on the 19th.

"G. W. C., of N. Y."—Your plan is good and very simple, it is the same as that used by Ransom Cook, of Saratoga Springs. The gas is carried from the smoke pipe back through the fire by a simple arrangement, and can be regulated at pleasure. The expense is reduced to about 30 per cent. We shall publish it at some future time. $1 received.

"L. J., of Iowa."—Your device to be employed as a substitute for the crank, is found to possess no novelty. It is believed also to be destitute of real merit, and you are advised not to expend time or money upon it; several honest inventors have travelled over the same road and missed the object of their search. $1 received.

"J. N., of Md."—The sketches of your alleged improvements in pumps have been examined. We must request you to send models of them to this office as we do not discover anything new in either, which may arise for want of a proper description of the parts. We should think the principle of the first to be essentially the same as Dr. Reed's pump, patented Sept., 1848. We do not think it advisable for you to apply for Letters Patent as the chance of success is very limited. In fact so many patents have been granted on pumps, that it is impossible to advise with certainty.

"B. F. S., of Tenn."—We are unable to make anything out of your article upon mathematics, and we have filed it away subject to your order.

"J. F., of Boston."—It is not for us to decide upon matters of infringement. We cannot do it without prejudicing the interests of patentees. If we give ourselves up to this business we should have plenty to do.

"H. L., of Mass."—We cannot tell what your machine is, from your description.

"J. L. D., of Iowa."—You can obtain all the tools and machinery you require of T. J. Wood, corner of Chatham and Duane sts., this city. He supplies joiners and carpenters with such machinery as they require in their business. We advise you to address him, as we cannot afford you what information you desire.

"M. J. P., of Geo."—Don't trouble yourself about perpetual motions. They will never pay you. There is nothing new in the plan you propose. It has been shown us before. You had better send the model of the water wheel to this office, as we are of the opinion that it is new and patentable. The numbers of Ewbank's Hydraulics cannot be obtained in this city, price of bound volumes is $2,50.

"W. A. C., of Pa. and P. B. H., of N. H."—We shipped a concentric lathe to each of you last Wednesday week.

"S. C., of Del."—Your question would be answered if you had given us your full name. There must be some dark spot about the business or else you are ignorant of the rules of publishers.

"I. F. D., of Brooklyn."—Your enquiries were answered by letter.

Money received on account of Patent Office business, since Jan. 21, 1851:—

J. S. S., of N. Y., $25; G. B. W., of Mass., $28; H. H. O., of Conn., $20; T. H. & Sons, of L. I., $30; and J. W. R., of N. Y., $28; W. R., of Mass., $10: H. C. & G., of Ill., $35.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and the year the patent was granted (adding the month of the year when convenient), and enclosing one dollar as fee for copying.

ADVERTISEMENTS.

Terms of Advertising:

One square of 8 lines, 50 cents for each insertion.
" 12 lines, 75 cts., " "
" 16 lines, $1,00 " "

Advertisements should not exceed 16 lines, and cuts cannot be inserted in connection with them at any price.

Patent Office.

128 FULTON ST.

NOTICE TO INVENTORS.—Inventors and others requiring protection by United States Letters Patent, are informed that all business relating to the procuration of letters patent, or filing caveats, is transacted at the Scientific American Office, with the utmost economy and despatch. Drawings of all kinds executed on the most reasonable terms. Messrs. Munn & Co. can be consulted at all times in regard to Patent business, at their office, and such advice rendered as will enable inventors to adopt the safest means for securing their rights.

Arrangements have been made with Messrs. Barlow, Payne & Parken, Patent Attornies, in London, for procuring Letters Patent in Great Britain and France, with great facility and dispatch.

MUNN & CO.,
128 Fultonstreet, New York.

PATENT DREDGE BOAT.—The subscriber having obtained a patent for improvements on the Dredge Boat, offers to sell rights to build and to use his Patent Dredge Boat in any part of the United States; the excavating apparatus consists of twenty scoops, preceded by plows receiving great pressure, and are capable of raising eight or ten cubic yards of mud or gravel per minute; the scooping apparatus may be fitted on an old steamboat or other vessel, for the purpose of removing bars or other obstructions to navigation. A working model may be seen by calling on the subscriber. JAMES CALLAGHAN,
20 10* No. 64 Spruce st., New Bedford, Mass.

WILSON'S SEWING MACHINE—New York Jan 17, 1851.—This is to certify that E. E. Lee, Esq., has made for our store several pairs of pantaloons, on his sewing machine, which we find to be done quite as well as is usually done by hand labor. G. P. & J. B. WILKINSON, Manufacturers of Clothes, 30 John st., cor. Nassau. 20 3*

NEW YORK, JAN. 16th, 1851.—We have appointed Warren Gale our Agent for the sale of A. B. Wilson's Sewing Machine rights in the State of Ohio. E. E. LEE & CO.

The Subscriber will open an office in a few days, in Cincinnati, for the sale of rights of A. B. Wilson's Sewing Machine. All orders for machines or rights can be addressed to me, at Cincinnati.
19 4* WARREN GALE.

LAW'S PERFECTED PLANER—For plank, boards, &c., is in daily operation in Brooklyn, corner of Water and Jay sts. This machine faces and matches at the same time, and cannot be excelled in either respect. All kinds of planing done at the shortest notice. Law's Stave Machine dresses and joints without assorting, staves of all shapes, and widths, by once passing through. Rights or machines for sale by H. LAW, 216 Pearl st., N. Y. 19 8

SCRANTON & PARSHLEY, Tool Builders, New Haven, Conn., will have finished 2 Power Planers ready to ship by the 1st of Feb., that will plane 9 feet long, 31 inches wide, and 24 inches high, with angle feed; counter shaft, pullies, and hangers, splining and centre heads, with index plate, and weigh over 5,000 lbs.; also 2 power planers that will plane 5 feet long, 22 in. wide, and 20 in. high, with counter shaft, pullies, and hangers, and weigh 2,400 lbs.—These planers are 25 per cent. lower than any others built. Cuts can be had by addressing as above, post paid. 19tf

1851 TO 1856.—WOODWORTH'S PATENT PLANING MACHINE.—Ninety-nine hundredths of all the planed lumber used in our large cities and towns, continues to be dressed with Woodworth's Patent Machines, which may be seen in constant operation in the steam planing mills at Boston, Philadelphia, New York, Jersey City, Williamsburgh, Brooklyn, Albany, Troy, Utica, Rome, Syracuse, Geneva, Rochester, Lockport, Buffalo, Elmira, Pittsburg, Jamestown, Gibson, Binghampton, Ithaca, &c. &c. The price of a complete machine is from $100 to $1,000—according to size, capacity, and quality. Persons holding licenses from the subscriber are protected by him against infringements on their rights. For rights to use these machines in the Counties of Queens, Richmond, Suffolk, and Westchester, and the other unoccupied counties and towns of New York, and Northern Pennsylvania, apply to JOHN GIBSON, Planing Mills, Albany, N. Y. 18 4*

PATENT RIGHTS FOR SALE—Goodman's Improvement for Turning Irregular Forms.—This machine has been patented about two years, and is well adapted to turning spokes, lasts, and handles; it differs from all other machines in having a combination of mandrels connected by gears, each of which holds one end of a stick to be turned, the other end being fastened by a common centre; over these hangs a cylinder, with cutters of sufficient length to come in contact with all the pieces to be turned, it being at right angles with them. Machines are now in operation which turn 4 spokes at a time, which will turn 50 an hour, leaving them better to finish than any other machine in use. For particulars, address DANIEL STONE, Dana, Mass. 18 5*

HUTCHINSON'S PATENT STAVE MACHINE.—C. B. HUTCHINSON & CO., Waterloo, N. Y., offer for sale town, county and State rights, or single machines, with right to use the same. This machine was illustrated in No. 2, Vol. 5, Sci. Am.; it will cut from 1,500 to 2,000 perfect staves per hour. We manufacture machines of different sizes, for keg, firkin, barrel and hogshead staves; also, heading shingle, and listing and jointing machines. These machines may be seen in operation at St. Louis, Mo.; Chicago, Ill.; Savannah, Ga.; Madison, Ia.; Ithaca, N. Y.; Waterloo, N. Y.; Bytown, C. W. Letters directed to us, post-paid, will receive prompt attention.
15 3m*

LEONARD'S MACHINERY DEPOT, 116 Pearl st., N. Y.—The subscriber has removed from 66 Beaver st. to the large store, 116 Pearl st., ayd is now prepared to offer a great variety of Machinists' Tools, viz., engines and hand lathes, iron planing and vertical drilling machines, cutting engines, slotting machines, universal chucks, &c. Carpenters' Tools—mortising and tennoning machines, wood planing machines, &c. Cotton Gins, hand and power; Carver Washburn & Co.'s Patent. Steam Engines and Boilers, from 5 to 100 horse power. Mill Gearing, wrought iron shafting and castings made to order. Particular attention paid to the packing, shipping, and insurance, when requested, of all machinery ordered through me. P. A. LEONARD.
15 3m

TO IRON FOUNDERS, &c.—Fine ground and bolted Foundry Facing, viz.: Sea Coal, Charcoal, Lehigh, Soapstone, and Black Lead. Fire Clay, Fire Sand, Kaoline, and Fire Brick; also Iron and Brass Founder's superior Moulding Sand, in barrels, or otherwise, for sale by G. O. ROBERTSON, New York. City Office, 4 Liberty Place, Liberty street, near the Post Office. 13 5*

WANTED—By a Southern foundry and machine shop, in a healthy and desirable location, a man who is practically acquainted with, and fully experienced in the inside management and conduct of a foundry and machine shop. The establishment is large and requires for the office a man fully qualified as a designer and draughtsman, and thoroughly acquainted with, and experienced in engine and mill works of all descriptions. To a party who can furnish the very best testimonials from undoubted sources, of the highest qualifications, and who may render satisfaction, permanent employment will be given, none other need apply. A bond of five thousand dollars with approved security for faithful and competent discharge of duty will be required. The salary will be from $2000 to $3000, dependent upon the reputation, general experience, and character of the party. All communications will be regarded, strictly confidential. Address, with real name, post paid, box 664, New York City.

ALSO—An experienced and thorough Designer and Draftsman, for a Southern foundry and machine shop: one thoroughly versed in engine and mill work. 17 5 *

WANTED—By a couple of Lowell Overseers, a Cotten Mill of about 4,000 spindles, making cloth from No. 12 to 20, to run by the job. Both of the men are practical manufacturers and mechanics. Address X Z, box 704 Lowell Post Office. 19 2*

WORLD'S FAIR, LONDON, in 1851—ANDREW P. HOW, Civil Engineer and Machinist, 35 Mark Lane, London, England. Mr. How is a native of the United States, in the above named business in the city of London. He offers his services to those of his countrymen who may have any kind of steam or other machinery to be exhibited at the Great Fair. He will, if required, receive it on arrival, and do all that may be necessary towards its erection, &c. References in New York—Thos. Sewell, 701 Broadway; Joseph Barton, 516 Grand st.
16 8*

WATER POWER FOR SALE OR TO LEASE—55 miles from New York, and 3 miles from the Harlem R. R. Depot at Croton Falls. There is a never-failing stream of water, with a fall of 200 feet in one-third of a mile, and about 150 horse power, without any cost of damming or danger from floods. It is a fine situation for a series of small manufactories and mechanic employments requiring motive power. There are on the premises, consisting of 11 acres of land, a grist and plaster mill, with three runs of stone, and a dwelling house. The country is healthy, fruitful, and picturesque. Enquire of T. R. LEE, Croton Falls. 15 6*

TO TIN PLATE AND SHEET IRON WORKERS.—ROYS & WILCOX, Mattabesett Works, East Berlin Station, on the Middletown Rail Road, manufacture all kinds of Tools and Machines of the best quality, both in material and workmanship. This establishment being the only one where both tools and machines are manufactured, superior indncements are offered to the trade; all work warranted, with fair use. Agents in most of the principal cities of the United States and Canada. Orders promptly attended to. F. ROYS,
E. WILCOX.
Berlin, Conn., Nov. 1, 1850. 7 1amly

TO IRON FOUNDERS AND MACHINISTS in the Northern and Eastern States.—The Subscriber, sole agent for the sale of rights to make and sell the celebrated Bogardus Horse Power, will contract with any one disposed to manufacture the best horse power in the world, upon reasonable terms. Address GEORGE VAI, Morristown, N. J
1a m1y*

THE SUBSCRIBER is now finishing four 14 horse engines, with boiler and apparatus all complete—price $1200 each. Several 6 horse engines extremely low; also, several of smaller capacity, complete; also, several power plainers, now finishing.—Galvanized chain for water elevators, and all fixtures—price low—wholesale and retail. Orders, post-paid, will receive prompt attention. AARON KILBORN.
No. 4 Howard st., New Haven, Conn. 18 10*

WILLIAM W. HUBBELL—Attorney and Counsellor at Law, and Solicitor in Equity, Philadelphia, Penn.

FOR SALE—A small Steam Engine and Tubular Boiler, of one horse power, in complete order. Apply at No. 12 Spruce st., 3rd story. 18 3*

DICK'S GREAT POWER PRESS.—The public are hereby informed that the Matteawan Company, having entered into an arrangement with the Patentee for the manufacture of the so-called Dick's Anti-Friction Press, are now prepared to execute orders for the following, to which this power is applicable, viz.—Boiler Punches, Boiler Plate Shears, Saw Gummers, Rail Straighteners, Copying and Sealing Presses, Book and Paper Presses, Embossing Presses, Presses for Baling Cotton and Woollen Goods—Cotton, Hay, Tobacco, and Cider Presses; Flaxseed, Lard, and Sperm Oil Presses; Stump Extractors, &c. &c. The convenience and celerity with which this machine can be operated, is such that on an average, not more than one-fourth the time will be required to do the same work with the same force required by any other machine.

WILLIAM B. LEONARD, Agent,
13tf No. 66 Beaver st., New York City.

MACHINES FOR CUTTING SHINGLES. The extraordinary success of Wood's Patent Shingle Machine, under every circumstance where it has been tried, fully establishes its superiority over any other machine for the purpose ever yet offered to the public. It received the first premium at the last Fair of the American Institute—where its operation was witnessed by hundreds. A few State rights remain unsold. Patented January 8th, 1850,—13 years more to run. Terms made easy to the purchaser. Address, (post-paid) JAMES D. JOHNSON, Redding Ridge, Conn., or Wm. WOOD, Westport, Conn.. All letters will be promptly attended to. 10tf

GURLEY'S IMPROVED SAW GUMMERS—for gumming out and sharpening the teeth of saws can be had on application to G. A. KIRTLAND, 205 South st., N. Y. 10tf

A CARD.—The undersigned begs leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers, and manufacturers of all kinds of instruments, to his new and extensive assortment of fine English (Stubs) and Swiss Files and Tools, also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English style, which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN, Importer of Watchmakers' and Jewellers' Files and Tools, and manufacturer of Mathematical Instruments, 154 Fulton street. 1 6m*

TO PAINTERS AND OTHERS.—American Anatomic Drier, Electro Chemical graining colors, Electro Negative gold size, and Chemical Oil Stove Polish. The Drier, improves in quality, by age—is adapted to all kinds of paints, and also to Printers' inks and colors. The above articles are compounded upon known chemical laws, and are submitted to the public without further comment. Manufactured and sold wholesale and retail at 114 John st., New York, and Flushing, L. I., N. Y., by

QUARTERMAN & SON,
9tf Painters and Chemists

MACHINERY.—S. C. HILLS, No. 12 Platt Street, N. Y., dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills Kase's, Von Schmidt's, and other Pumps, Johnson's Shingle machines, Woodworth's, Daniel's and Law's Planing machines, Dick's Presses, Punches, and Shears; Morticing and Tennoning Machines, Belting, machinery oil; Beal's patent Cob and Corn Mills; Burr Mill, and Grindstones, Lead and Iron Pipe, &c. Letters to be noticed must be post paid. 10tf

BAILEY'S SELF-CENTERING LATHE, for turning Broom and other handles, swelled work, chair spindles, &c.; warranted to turn out twice the work of any other lathe known—doing in a first rate manner 2000 broom handles and 4000 chair spindles per day, and other work in proportion. These lathes are simple in construction, not liable to get out of repair, and will do enough more than other lathes, in three months' use, to pay their cost. One of them may be seen at the office of Munn & Co., New York. Price of Lathe for turning broom and hoe handles, rake stales, scythe snaths, windsor and cottage chair legs and pillars, $100, with one set of tools; $125 with two sets. Lathe for turning chair spindles, whip stocks, gun rods, &c., complete, $75. Orders, post-paid, may be forwarded to L. A. SPADING, Lockport, N. Y. 9 3m

FOREIGN PATENTS.—PATENTS procured in GREAT BRITAIN and her colonies, also France Belgium, Holland, &c., &c., with certainty and dispatch through special and responsible agents appointed, by, and connected only with this establishment.—Pamphlets containing a synopsis of Foreign Patent laws, and information can be had gratis on application

JOSEPH P. PIRSSON, Civil Engineer,
7tf Office 5 Wall street, New York.

RAILROAD CAR MANUFACTORY.—TRACY & FALES, Grove Works, Hartford, Conn. Passage, Freight and all other descriptions of Railroad Cars, as well as Locomotive Tenders, made to order promptly. The above is the largest Car Factory in the Union. In quality of material and in workmanship, beauty and good taste, as well as strength and durability, we are determined our work shall be unsurpassed. JOHN R. TRACY,
16tf. THOMAS J. FALES.

FOWLERS & WELLS, Phrenologists and Publishers, Clinton Hall, 131 Nassau st., New York—Office of the Water Cure and Phrenological Journals. Professional examinations day and evening. 3 6m

MANUFACTURERS' FINDINGS and Leather Binding.—The subscriber is prepared to offer a large assortment of manufacturers' Findings for Cotton and Woollen Factories, viz., bobbins, reeds, harness, shuttles, temples, rockers, harness twines varnish, roller cloth, card clothing, card stripper and clamps, calf and sheep roller, leather, lace, and picker string, potato & wheat starch, oils, &c. Leather Banding, of all widths, made in a superior manner from best oak tanned leather, rivetted and cemented.
15 3m P. A. LEONARD, 116 Pearl st.

UNITED PATENT OFFICE IN PARIS AND LONDON.—GARDISSAL & CO., 9 Arthur st., west, city, London; Paris, 29 Boulevard St. Martin.—Procuration of Patents for England, Ireland, Scotland, France, and all countries; and transactions of all business relating to patents, (sale and licenses,) specifications, oppositions, &c. "The Invention," monthly journal, $1 a year. 15 4m*

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 1 1-4 to 7 inches in diameter. The only Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine, and other Steam Engine Boilers.

THOS. PROSSER & SON, Patentees,
16tf 28 Platt st., New York.

STRAW CUTTER FOR SALE.—We have on hand one of Macomber's Improved Straw Cutters, patented Nov. 5, 1850, illustrated in No. 50, Vol. 5, Sci. Am. Price $10. Address MUNN & CO.

© 1851 SCIENTIFIC AMERICAN, INC.

Scientific Museum.

To Dye Ivory.

In many branches of business it is very desirable to know how to color ivory. The red balls of the billiard table, and the red colored chessmen, are evidences that the art of coloring ivory is known to many, but the number is not numerous, and we have not been able to find anything said, satisfactorily, on the subject, in any printed work. The Chinese appear to be the most eminent in making fancy ivory articles, and they color them with great taste, but red appears to be the only color for which they are distinguished, and it is the predominant one—the red and white forming the varieties. We have had our attention called to the subject lately, and we present the following as the result of experiments:—

Red Color.—The hands should be washed in soap and water to free them from any grease that may be on them; the ivory should be washed in some cold strong soap-suds, and then well rinsed in cold water. A clean copper or brass dipper, or any small copper vessel, filled with soft water, should be placed on a fire and kept boiling, with some ground cochineal, for about ten minutes, (about two tea-spoonsful of the cochineal will dye three billiard balls). After it has been boiled for this length of time, add a pinch of cream of tartar, between the fingers, and six drops of the muriate of tin, (if the tin cannot be obtained a little alum will answer); this is all stirred about and the ivory put in. After the ivory has boiled about one minute, it is taken out and dipped in a vessel of clean cold water, and then put into the boiling cochineal for the same length of time, and taken out again. It is thus dipped in and taken out of the boiling cochineal, until it attains a beautiful red color, when it is well washed in warm water, and rubbed over with a white cloth which has been lightly greased. Care must be taken not to use too much cream of tartar or the chloride of tin, for these substances injure the surface of the ivory. Those who do not care about the price of the cochineal, may use four tea-spoonsful, and the ivory will be colored quicker. The greater the amount of dye stuff used the deeper will be the color.

Black.—For this color the ivory should be cleansed the same as for red. An iron or tin vessel may be used to dye this color. Take about four ounces of ground logwood, and boil it for fifteen minutes, then add one-fourth of an ounce of copperas, and put in the ivory and boil it gently for about ten minutes, when it may be taken out and washed. If the color appears slaty (light), more logwood should be added, and the ivory boiled some time longer. The ivory can also be dyed black by boiling it for about ten minutes in the same quantity of copperas as that mentioned, and a little of the bichromate of potash, then airing the ivory and boiling it in the logwood afterwards. When the color is deep enough it must be washed and rubbed with a greasy cloth, when it will appear jet black.

These two colors are the most common in ivory articles, especially the red. Ivory is bleached white by exposing it to the sun, after being washed in soap suds and moistened from time to time, with clean soft water. A little whitening and soap, used together, is a good composition for cleaning the ivory handles of knives. We may refer, at some other time to the mode of dyeing other colors on ivory.

Water Gas.

The discovery of Water Gas, we understand, was made several years ago, and resulted from joint experiments by Dr. Charles T. Jackson, of Boston, and Cornelius Mathews, Esq., of this city—gentlemen who have, in many ways and on many occasions evinced extraordinary inventive faculties, but whose modesty has generally prevented the exposition of their triumphs until others, obtaining intimations of them surreptitiously, have indecently brought them forward as their own.—[Mirror.

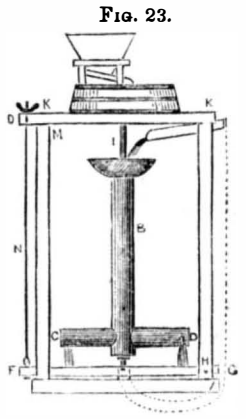
[Did Mr. Mathews, author of some novels, inform the author of the above that he, along with Dr. Jackson, discovered water gas, or did Dr. Jackson do so? Surely neither of them. No man would propagate the above, who had read the most simple elementary work on chemistry. Water Gas was discovered by Lavoisier more than sixty years ago. The whole of the above, we have no doubt, is a joke of the Mirror's.

For the Scientific American.

Hydraulics.

(Continued from page 152.)

Fig. 23.



Re-action Wheels.—In the last number, the experiments of Newton and Ewart, on the re-action of water, were briefly described. It is to be regretted that so much difference of opinion exists upon the subject. The great cause of this must be owing to incorrect experiments—experiments founded on a wrong basis. A great number of experiments, upon a large scale, and these conducted by different individuals, keeping a correct register of every minute circumstance, and the most minute arrangement, would lead to correct conclusions, and establish true principles.

The subject of Re-action Water Motors, Turbines, and this class of machines, is one of great importance, because this class of motors is so numerous in America, and so applicable to the propulsion of machinery in situations where other wheels could not be employed so economically, at least. General information on this subject is too limited and very varied, as may be judged from the single fact, that no less than about thirty patents have been granted for improvements on this kind of wheels. We will present, however, a great deal of what may be new to a great number, and, at least, what may be considered the best illustrated and arranged information to be found in any work on the same subject. We will begin first with the oldest Re-action Wheel, namely, the well-known Barker's Mill. This wheel is represented as driving a grist mill. A is the water pipe to bring the water to the upright tube, B, into the horizontal arms, D C, where the water discharges. These orifices had slides on them, to increase or diminish their diameter. Those wheels which have been constructed in latter years, with moveable buckets for regulating the discharge, have no new application in such an arrangement; I is the spindle of the wheels, it is secured to the tube and arms to turn with them.

The lower end of the spindle is secured in proper bearings—an oil box, or otherwise. The top of the spindle goes square into the eye of the upper mill stone to drive the stone along with and at the same velocity as the wheel. The nether mill stone is secured on the floor, K, and the ground meal may fall through a spout placed at about M. It will be observed that the bearing of the spindle gudgeon, below, is in a bridge tree, G F, which has a pivot, H, on which it moves; and it is supported by an iron rod, N, which passes through the bracket, O, and it has a screw-nut on its top, which, by screwing, raises or lower the mill stone at pleasure. A pulley or a bevel wheel, on the top of the spindle, to drive other machinery, may be applied. While the tube, B, is kept full of water from the pipe, A, and the water continues to run out from the ends of the horizontal arms, the water will revolve, carrying round the millstone. If we suppose four, or six, or more arms to be cast on this motor, and these arms to be curved, instead of being straight, or the two arms to be curved, we shall have almost all the modifications of modern re-action wheels. Far more credit should be given to the Barker Mill than is in general awarded to it.

If the discharging orifices were stopped, no motion would ensue, even though the tube and arms were full of water; the pressure would then be equal against all parts of the sides within.

As early as 1775, Mathon de la Cour, a Frenchman, instead of bringing in the water by the upper spout, A, brought it in by a spout (shown by dotted lines) at the bottom to the horizontal arms. James Rumsey, of Virginia, our ingenious countryman, adopted the same plan about the same time. This was a great improvement, as it relieved the lower gudgeon of the spindle, greatly modified the vertical pressure, and consequently gave the machine a greater centrifugal effect.

Smoky Chimneys and Fire-Places.

The Editor of the Wheeling (Va) Luminary, gives the following as the result of his study of the principles of chimney draught and the application of the principles to practice.

"There are many theories on the subject of chimney building, and many devices to remedy bad construction. Many of the theories are wild, and many of the devices exceedingly unphilosophical. Now there is only one general theory essential in all chimneys, and that is the apportionment of the *throat* to the opening or *draught* of the room, the closer the room the less the throat; always keeping the throat less than the compass of atmosphere admitted into the room. It would be well also to have the fire-place large enough to build in a false wall &c., which will always place the difficulty under control.

Let the chimney be high enough not to be interfered with by adjoining buildings.

Let the fire-place be large enough to admit filling in.

Let the offset in the back-wall be at least one foot above the upper part of the fire-place opening.

Let the throat be contracted, leaving it largest in the centre, until the difficulty is remedied.

If these conditions are met, it matters little about the size or shape of the flue above. This is proved in the building of furnaces when heavy draught is required.

Fire-Places.—In the construction of these there is, especially in cities, a great want of judgment. There are several points to be considered: neatness, or beauty, economy and comfort. In building a house, undoubtedly the first consideration should be comfort, the second, economy, whether we build for ourselves or to rent to others. We regret to say that there seems to be an utter disregard of these in nearly all the houses in the city, and too many in the country pattern after our city fashionables. Small fire-places are all the rage; a little square, deep, low, narrow hole in the wall, hemmed in on all sides with iron casements, is all that is left to be called a fire-place: the result is, 1st, the heat is thrown into the room in a straight line agreeing to the width of the opening, and those only who sit immediately in front of the 8 by 10 opening get the benefit of the fire on one side, while those who sit right and left might as well be some other place. 2nd—An insufficient quantity of heat to warm the room, is thrown out. One-half or two-thirds passing up the chimney, to the disadvantage of comfort and economy.

The next question is, how should they be built? Answer:—high, wide, and deep, so as to admit of filling in with a circular back-wall, presenting a large opening and surface from which to reflect the heat to all parts of the room, and at the same time secure the draft."

The mammoth printing press of the New York Sun, manufactured by Col. Richard M. Hoe, is now in operation, printing 20,000 copies per hour. It is the largest printing press in the world.

The Committee of the New York State Agricultural Society have appropriated $400 to be awarded to such of those members as may successfully compete at the approaching World's Fair.

Wanted,

A copy of the "Digest of American Patents," which was published by the Patent Office about 4 years ago, containing a list of patents granted from 1790 to 1848. By sending a copy of the above to this office, a bound volume of the Scientific American will be sent in exchange, or a reasonable sum will be paid in cash.

LITERARY NOTICES.

"A Guide to the Scientific Knowledge of Things Familiar," by Rev. Dr. Brewer, Master of King's College School, Norwich, England, carefully revised and adapted for use in families and schools of the United States. Published by C. S. Francis & Co., 252 Broadway. The preface to this admirable work truly says, "no science is more generally interesting than that which explains the common phenomena of life." There are hundreds of facts which have become familiar to the world, yet in a majority of instances the reasons cannot be given. This work makes us readily familiar with these facts. We take, by way of illustration, and to more fully explain the character of this "Guide," the following question and the answers given. "Q. What produces electricity in the clouds? A. 1st, The evaporation from the earth's surface. 2nd, The chemical changes which take place on the earth's surface; and, 3rd, Currents of air of unequal temperature, which excite electricity by friction, as they pass by each other,"—and thus it goes on through almost the entire range of the sciences, rendering them comprehensible to the humblest capacity. We say, unqualifiedly, that this is one of the most useful books that has appeared for many years, and while we thank the publishers for a work so intrinsically valuable, we sincerely hope that parents and teachers will use their efforts to introduce it extensively as a text book in schools and families.—Throw the novels into the fire and give place to Dr. Brewer's Catechism of the Sciences. It will do good, and we can but hope that our young friends will reap much benefit from its careful study.

Brown's Angler's Almanac, for 1851, contains many interesting facts and anecdotes for anglers, and is calculated for all parts of the United States. Price 12 1-2 cts. Sold by J. J. Brown & Co., 103 Fulton st.

We have received from Messrs. Dewitt & Davenport the February numbers of Graham's and the Ladies' National Magazines; each is beautifully embellished, and contains choice reading matter. Graham's Fashion Plate is one of the prettiest we have ever seen.

Nos. 32 of Phillips, Sampson, & Co.'s beautiful edition of Shakspeare's Dramatic Works, is issued and for sale by Dewitt & Davenport. It embraces the play of "Cymbeline," and an elegant steel engraving of Imogene. Six more numbers complete the work.

The Photographic Art Journal, Vol. 1, No. 1.; edited by H. H. Snelling, and published monthly at $5 per annum, by W. B. Smith, No. 61 Ann st. This number of the journal contains 64 pages of clearly printed matter relating to the Photographic art; also a portrait of M. B. Brady, the accomplished daguerrian artist, 205 Broadway. The subjects treated of cannot fail to interest and instruct all who take an interest in the photographic art. The work, entire, is highly creditable to the editor and publisher, and we wish it success.

MECHANICS

INVENTORS
AND
MANUFACTURERS.

The Best Mechanical Paper
IN THE WORLD!
SIXTH VOLUME OF THE
SCIENTIFIC AMERICAN.

The Publishers of the SCIENTIFIC AMERICAN respectfully give notice that the Sixth Volume of this valuable journal, commenced on the 21st of September last. The character of the Scientific American is too well known throughout the country to require a detailed account of the various subjects discussed through its columns.

It enjoys a more extensive and influential circulation than any other journal of its class in America.

It is published weekly, as heretofore, in *Quarto Form*, on fine paper, affording, at the end of the year, an *ILLUSTRATED ENCYCLOPEDIA*, of over FOUR HUNDRED PAGES, with an Index, and from FIVE to SIX HUNDRED *ORIGINAL ENGRAVINGS*, described by letters of reference; besides a vast amount of practical information concerning the progress of SCIENTIFIC and MECHANICAL IMPROVEMENTS, CHEMISTRY, CIVIL ENGINEERING, MANUFACTURING in its various branches, ARCHITECTURE, MASONRY, BOTANY,—in short, it embraces the entire range of the Arts and Sciences.

It also possesses an original feature not found in any other weekly journal in the country, viz., an *Official List of PATENT CLAIMS*, prepared expressly for its columns at the Patent Office,—thus constituting it the "*AMERICAN REPERTORY OF INVENTIONS.*"

Terms—$2 a-year; $1 for six months.
All Letters must be Post Paid and directed to
MUNN & CO.,
Publishers of the Scientific American,
128 Fulton street, New York.

INDUCEMENTS FOR CLUBBING.

Any person who will send us four subscribers for six months, at our regular rates, shall be entitled to one copy for the same length of time; or we will furnish—

10 copies for 6 mos., $5 | 15 copies for 12 mos., $22
10 " 12 " $15 | 20 " 12 " $28

Southern and Western Money taken at par for subscriptions; or Post Office Stamps taken at their full value.

PREMIUM.

Any person sending us three subscribers will be entitled to a copy of the "History of Propellers and Steam Navigation," re-published in book form—having first appeared in a series of articles published in the fifth Volume of the Scientific American. It is one of the most complete works upon the subject ever issued, and contains about ninety engravings—price 75 cents.

© 1851 SCIENTIFIC AMERICAN, INC.